CHAPTER VII.—PRODUCTION OF THE PRECIOUS METALS.

METHOD FOLLOWED IN COMPILATION.

Three principal methods have been adopted by statisticians in studying the bullion production of the United States.

The first and most obvious plan has been to use as a basis the receipts of domestic bullion reported by the several mints and United States assay offices, ascertaining the probable total product by adding to the figures thus obtained the amount shipped abroad, as shown by the custom-house returns, and the probable amount consumed in the arts. The objections to this method are: The amount coined within a certain period does not necessarily correspond to the production for that period. In the same way the proportion of the domestic product exported may be largely affected by the stock of precious metals on hand at any given time. Both of these variations depend primarily upon fluctuations in the bullion market and international balance of trade. An average of a ong series of years would give tolerably accurate results; but for any stated period the figures of coinage, export, and consumption in the arts are apt to be deceptive.

Assuming the source of the bullion deposited at the mints to be correctly stated, there are still serious and unavoidable defects in the custom-house statistics, notwithstanding the care taken to secure accuracy. No account is taken of bullion transported overland into Canada, nor are the export figures for doré bullion, base bullion, ores, and matte shipped abroad always to be depended upon. This difficulty is particularly manifested in the last three instances. The regulations prescribed by the custom-house authorities are not followed by penalties sufficient to insure accurate invoicing of the values thus exported. It is well known that during the period of intense speculation in gold a very large proportion of both receipts and exports, even of gold coin, was entirely hidden from official scrutiny, with a still greater margin in the bullion movement, and although the inducements to a concealment of the actual movement do not now exist in the same force it is still doubtful whether the official figures are entirely reliable. A less important source of error is the undisputed fact that not infrequently bullion of domestic production, after having been shipped abroad, is, from changes in the silver-bullion market or from the necessities of coinage, reimported into the United States.

It will thus be seen that the best results which can be hoped for from the most careful application of the "consumption and export" method are close approximations extending over considerable periods, but not the exact product for any given year. The system also fails to segregate the yield according to the productive source; and while the geographical distribution by state and territorial lines may be shown, it is hardly possible to carry the analysis further and ascertain in this way the yield of single districts or even counties.

The director of the mint has examined the bullion product of the country critically from the "consumption and export" point of view, employing as a supplementary means of information the details obtainable by correspondence and circulars scattered through the mining districts. The substantial accuracy of the estimates thus reached has been fully borne out by the results of the present investigation.

The second, or "transportation" method, consists in estimating the product from the statistics of the express companies, freight lines, and banks which have the handling of the product from its original sources. This plan would give more satisfactory results if, in the first place, all the bullion, ores, etc., were transported from the producing points through these different channels alone, and if, in the second place, none of the product were reshipped from point to point and thus twice recorded. As a matter of fact, there is a considerable portion of the gold yield sent through the mails as registered matter, and a large proportion passes from the productive source into the market through private channels. Both of these means of conveyance are affected by proximity to main lines of communication, or, on the other hand, by the absence of express or railroad facilities; and in neither can the exact effect of these circumstances be very definitely counted upon. In the Pacific states and territories the great bulk of the mine output is handled by Wells, Fargo & Co.'s express, and upon the detailed returns of the many offices of this company Mr. J. J. Valentine, general superintendent, has been enabled to furnish very valuable estimates of the bullion production, covering a long series of years. The business connections of this express company in portions of the country not covered by their agencies have rendered it possible for Mr. Valentine to frame approximate estimates of the product of the mining territory outside of that from which Wells, Fargo & Co. are the principal transporters of bullion. But the impossibility of assigning to other channels the due proportion of the outflow through them; the fact that no record is made of the value of the gold bullion and dust sent through the mails; that no reliable allowance can be made for the undervaluation of gold dust and unassayed bullion by consignors, amounting in many cases to from five to ten per cent.; that there is no satisfactory means of checking the reshipments which are twice or more times recorded, combine to create a large margin which can hardly be

definitely accounted for in making the total estimates. Notwithstanding these palpable but unavoidable defects in the system, much credit is due Mr. Valentine for the painstaking care with which he has prepared his annual estimates.

The third system is one which, were it practicable to pursue it into complete details, would lead to results more satisfactory than could be obtained in any other way. This may be termed the direct method. It would consist, if properly carried out, in obtaining from each bullion producer a statement of the quota contributed. The aggregate of the details thus reached would represent the actual total product of the country, and would moreover segregate it according to districts. In the census work conducted by the United States geological survey the plan indicated has been followed to as minute detail as it was possible to extend it with the means at command. No attempt had ever been previously made which aimed at securing individual returns throughout the whole United States with the same degree of thoroughness, though the successful adoption of the direct method by Mr. A. Del Mar, in his investigation of the silver product of Nevada in 1876, showed the advantages of the plan. But even with all the care and time expended by the experts engaged in collecting these statistics it was found to be impracticable to do more than obtain returns from the larger producers. In some instances well-based and careful estimates were submitted by the experts, covering aggregates of a large number of small mines for whole districts. In other cases, and more especially in portions of the country where placer-mining on a small scale furnished a large proportion of the yield, reliance had to be placed on extraneous data.

The chief obstacles encountered in the collection of bullion statistics directly from the producers were—

First. The wide extent of the field to be covered and the vast number of mines to be reported upon. Even were the mines located in easily accessible places, the wide range of territory over which they are scattered would render the labor of personally visiting each productive district a tedious matter. But when it is considered that they are for the most part to be found in rugged mountainous tracts, often at high altitudes, and, when destitute of railroad communication, to be reached only by stage or on horseback, some idea may be gathered of the amount of work involved.

Second. The fact that a considerable yield is derived from small mines, the product from each of which, however insignificant in itself, goes to form part of an important aggregate, and should not be neglected.

Third. The reluctance of some mine owners and superintendents to give a full account of their operations, notwithstanding the strictly confidential manner in which these individual statements have been treated. On explanation of the purposes for which the statistics were collected such objections were in most cases overruled, however, and invariably great courtesy was personally manifested.

Fourth. The fact that in a large majority of cases no systematic accounts are kept by mine owners, who were often unable to state from memory the precise output of their properties for a period which had elapsed some time before the inquiry was made.

Fifth. Many mines having changed hands during the census year, it was frequently impossible to obtain from the present holders a statement of the operations conducted prior to the change in ownership, or to communicate with the former owners if they had removed.

Sixth. When, in the case of mines worked during only a portion of the census year, or during a season limited by the weather, water supply, or other causes, operations had been suspended at the time the district was visited by the examining expert, it was often impracticable to communicate with the only persons able to supply information.

Seventh. The variation in the fiscal year of the incorporated companies makes it a matter of much difficulty to reduce the returns to a different period from that for which the books are kept.

With means still less adequate than were lately at command the census authorities in 1870 found it impossible to trace the bullion product of the country at that time. The best results reached by the deputy marshals in certain instances hardly amounted to a moiety of the actual product, as known through other sources of information. In the case of the census of 1880, even with greatly increased facilities, there were many gaps in the testimony which had to be filled out by estimates derived from other data than those collected directly by the experts. Where such estimates have been applied in the tabulation, they have been indicated by an asterisk (*). In all cases a careful scrutiny has been exercised in the selection and comparison of material. It is believed, in view of the more extended and fuller details accessible, as compared with previous researches of the same nature, that the results reached in this compilation are as close an approximation to absolute accuracy as it is possible to attain without a far greater expenditure of money and time than the subject demands.

In compiling the material at hand the following system was adopted: The returns given in the individual mine schedules were first abstracted and grouped into aggregates for districts. Information as to the operations of the different establishments being in many cases confidential, publication of the results begins with the district exhibits. These, again, are condensed into tables for counties, and finally into abstracts for whole states and territories. Where a marked discrepancy existed between the schedule returns and other reliable data the necessary additions were entered and the fact that they were estimates indicated. It is hardly necessary to remark that the schedules would show deficiencies rather than an excess as compared with correlative data. At the same time the schedules of reduction works were examined, and furnished a valuable check upon the figures derived from the mine reports. In some instances the yield was quoted in ounces of fine metal, as is customary in localities where the ore is reduced by

smelting; in others, in ounces of crude bullion, as in the case of placer gold; in still others, in dollars calculated from the assay value of the bullion; and more rarely in dollars representing the net proceeds after deducting the discount upon silver and other charges. In order to present the whole in harmonious shape, it became necessary to reduce these various denominations to a uniform standard. That adopted is the ounce of fine metal and its assay value in United States money. The terms are interchangeable, and appear side by side in the tables of production. As a preliminary step a series of conversion tables was prepared.

CLASSIFICATION OF MINES.

Mines of the precious metals are grouped under two comprehensive heads: deep mines and placer mines. The former are workings in primary deposits, in which the ore usually, though not invariably, occurs in a vein, and while the earlier operations in mines of this class may begin at or near the outcrop of the vein the tendency is always downward. The leading varieties of deep mines are:

1. Mines of free gold, or gold alloyed with a small proportion of silver.
2. Mines of silver ores, containing only traces of gold.
3. Mines yielding doré bullion from milling ores, containing both gold and silver in appreciable quantities.
4. Mines yielding base bullion from smelting ores in which the precious metals are associated with larger quantities of lead, copper, etc.

All of these divisions shade imperceptibly into each other.

Placer or gravel mines are workings in secondary or fragmentary gold deposits, including gravels and sands, and are either surface or shallow workings, as compared with those of vein mines, though in somes localities gravel beds of several hundred feet in depth occur. The leading types are:

1. Hydraulic mines.
2. Dry washings.
3. Booming and shovel-sluicing.
4. River mines.
5. Pocket mines (not to be confounded with primary pockets or concentrations in deep mines).
6. Drift mines.
7. Branch mines.
8. Black sand littoral deposits.

In the tables of production the classification under these two main heads is observed.

CLASSIFICATION OF REDUCTION WORKS.

In some of the following tables a distinction is made between the production as shown by the different reduction works, which, like the mines, are divided into two principal classes. These are, first, amalgamating mills, including:

1. Gold quartz mills.
2. Mills in which silver ore is treated in the raw state.
3. Mills in which roasting is practiced before amalgamation.
4. Concentration works.
5. Chlorination and leaching establishments.
6. Arrastras.

The second class includes the several varieties of smelting works in which the production of base bullion, matte, or speiss is a preliminary step toward the final extraction of the precious metals.

Placer mines, with the exception of pocket mines and branch mines, require no reducing process, and in the two exceptions named the mill process is not always a necessary concomitant, in the former, in fact, but rarely. Various systems of reduction by chlorination and amalgamation have also been applied to black-sand deposits and refractory conglomerates containing placer gold, but not to an extent affecting the general principle of classification here maintained.

[NOTE.—In each of the tables of production and throughout this discussion the following explanations apply:

The short ton of 2,000 pounds is invariably used.

The ore tonnage is stated in gross tons; the assay values are of net tons, without allowance for moisture.

Mint values are assumed in all cases. The weight of bullion is given in troy ounces of fine metal. The gold ounce is taken at $20.671834, and the silver ounce at $1.2929. A statement of the estimated market value of the silver is elsewhere appended.

No account is taken of the value of the silver alloyed with placer gold in the primary production tables, as, with very few exceptions, no allowance is made for it in selling. This is treated of separately, and the proper addition made in the final summary.

The bullion yield is given according to the district in which the ore producing it was raised, without regard to the locality where the ore was reduced. This method of stating the product apportions it with reference to the original source so far as it is practicable to trace it. Were the yield to be credited to the reduction works, Omaha, Chicago, Saint Louis, Newark, New York, and other points remote from the mines, would appear as large producing centers.

Individual estimated amounts are designated by an asterisk (*), and where such estimates form a considerable proportion of the totals, the fact is similarly indicated.]

For a condensed summary of the total product the reader is referred to Tables CXXIII, CXXIV, and CXXIX, and the accompanying text pages, 358, 359, and 361, respectively.

STATISTICS OF THE PACIFIC DIVISION.

CALIFORNIA.

In production of gold California still holds the first place. Previous to the discovery of the Bodie district the placer mines furnished more than two-thirds of the total gold output of the state, but the large yield of that district, amounting to over two and three-quarter millions in gold during the year, in addition to the considerable silver product, has placed the deep mines about on a par with the placers in point of productiveness. The amount of silver contributed by California is relatively small, and comes mainly from two adjoining counties, Inyo and Mono.

There is a larger number of actively working mines in California than in any other state or territory, as, owing to the settled condition, transportation facilities, and comparative cheapness of labor and supplies, it is possible to mine deposits of lower grade than could be made profitable in localities having less advantages of position. The result is that there are, besides a few large incorporated companies, a great many mining properties worked on the small scale, but still profitably, by individual owners. The collection of accurate statistics regarding these smaller claims is a very tedious and also somewhat uncertain matter. Schedule returns were received from 128 deep mines, 147 placer mines, 57 amalgamating mills, concentration and leaching works, 9 arrastras, and 4 smelting works in this state. These include most of the more important establishments, and are supplemented by general reports, covering in some cases whole districts. But with all the care taken by the census experts to cover thoroughly the ground the subject was by no means exhausted, and in several cases in the accompanying tabulations resort has been had to information from outside sources.

California furnishes 71.47 per cent. of the total placer product of the United States and 40.09 per cent. of the total gold product of the deep mines, or 51.38 per cent. of the total gold product of the country (from all sources). The yield in silver, however, is only 2.80 per cent. of the total, California standing sixth in rank as a producer of the latter metal. In proportion to its area, again, California leads in production of gold, with an average of $108 30 per square mile; is sixth in its silver yield of $7 27 per square mile; and third as to its output of both metals, $115 57 per square mile. As the population of the state has largely increased, while the mine production has remained nearly at a standstill for some years, the showing in relation to population is less favorable, the yield of gold being only $19 83, silver $1 33, and that of both the precious metals only $21 16 per capita, placing California fifth as to gold, and eighth as to silver and the total, in the rank of the states. The prosperity of the state is not, however, dependent upon its mines in the same degree as formerly, agriculture and manufacturing having outstripped the earlier industry.

TABLE CXXI.—CALIFORNIA—PRODUCTION OF DEEP

	County and district.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.		
			Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
		Tons.	Dollars.	Dolls.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Dolls.	Dolls.	Dolls.
	AMADOR.													
1	Amador City (*a*)	38,112	18 67	.....	18 67	34,422.7	711,580	.....	.....	711,580	38,112	15 45	.....	15 45
2	Drytown	104	105 55	.....	105 55	531.0	10,977	.....	.....	10,977	104	95 00	.....	95 00
3	Jackson	26,620	8 16	.....	8 16	10,504.8	217,153	.....	.....	217,153	20,620	8 16	.....	8 16
4	Pine Grove	500	*35 00	.....	*35 00	*846.5	*17,499	.....	.....	*17,499	18	31 50	.....	31 50
5	Pioneer	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
6	Plymouth	40,369	14 64	.....	14 64	28,589.6	590,999	.....	.....	590,999	40,369	11 81	.....	11 81
7	Sutter Creek	6,636	10 55	.....	10 55	3,388.5	70,047	.....	.....	70,047	6,636	9 06	.....	9 06
8	Volcano	2,277	25 13	.....	25 13	2,773.3	57,329	.....	.....	57,329	2,277	20 14	.....	20 14
	Total	114,618	14 62	.....	14 62	81,056.4	1,675,584	.....	.....	1,675,584	108,136	12 49	.....	12 49
	CALAVERAS.													
1	Angel's Camp	1,900	14 58	.....	14 58	1,340.0	27,700	.....	.....	27,700	1,900	11 32	.....	11 32
2	Carson Hill	3	*6,783 00	.....	*6,783 00	*997.5	*20,620	.....	.....	*20,620	3	6,627 00	.....	6,627 00
3	Independence	2,600	60 65	.....	60 65	7,628.1	157,687	.....	.....	157,687	2,600	48 52	.....	48 52
4	Mesquite	125	121 00	.....	121 00	731.7	15,125	.....	.....	15,125	.....	.....	.....	.....
5	Mokelumne Hill (*b*)	38,000	6 23	.....	6 23	11,464.8	236,999	.....	.....	236,999	36,000	5 00	.....	5 00
6	Washington	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Total	42,628	10 74	.....	10 74	22,102.1	458,131	.....	.....	458,131	40,503	8 58	.....	8 58
	EL DORADO.													
1	Kelsey	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2	Mud Spring or Springfield	3,620	25 89	.....	25 89	4,533.4	93,714	.....	.....	93,714	3,620	20 61	.....	20 61
3	Placerville	900	27 72	.....	27 72	1,298.9	26,850	.....	.....	26,850	900	24 75	.....	24 75
	Total	4,520	26 76	.....	26 76	5,832.3	120,564	.....	.....	120,564	4,520	21 21	.....	21 21
	FRESNO.													
1	Potter Ridge (*c*)	578	150 00	13 00	163 00	4,194.1	86,700	5,812	7,514	94,214	578	120 00	10 40	130 40
	Total	578	150 00	13 00	163 00	4,194.1	86,700	5,812	7,514	94,214	578	120 00	10 40	130 40
	INYO.													
1	Alabama	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2	Beverage	354	*65 00	.....	65 00	1,113.1	23,010	.....	.....	23,010	354	50 00	.....	50 00
3	Cerro Gordo	4,223	94	83 86	84 80	191.2	3,952	273,962	354,206	358,158	4,223	79	33 27	34 06
4	Coso (*d*)	350	2 98	*55 94	58 92	50.5	1,044	15,144	19,580	20,624	350	2 68	50 65	53 03
5	Deep Spring Valley	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
6	Fish Springs	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
7	Kearsarge	200	.....	*55 00	*55 00	.....	.....	8,508	*11,000	*11,000	200	.....	47 00	47 00
8	Lee	100	.....	*75 00	*75 00	.....	.....	5,806	*7,506	*7,506	*100	.....	65 00	65 00
9	Lookout (*e*)	260	2 80	80 00	82 80	35.2	728	16,088	20,800	21,528	260	2 43	71 15	73 58
10	Pajaro	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
11	Panamint	600	.....	*70 00	*70 00	.....	.....	32,480	41,994	41,994	600	.....	61 90	61 90
12	Russ	500	*9 00	*8 00	*17 00	217.7	4,500	3,094	4,000	8,500	500	5 85	5 20	11 05
13	Snow's Cañon	100	4 00	17 00	21 00	19.3	399	1,315	1,700	2,099	100	2 00	13 00	15 00
14	Swansea	27	.....	257 72	257 72	.....	.....	5,382	6,958	6,958	27	.....	206 18	206 18
15	Tarrytown	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
16	Ubehebe (*f*)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
17	Union	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
18	Wauconda (*f*)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
19	Wild Rose	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Total	6,714	5 01	69 66	74 67	1,627.0	33,633	361,779	467,744	501,377	6,714	3 83	35 62	39 45
	LASSEN.													
1	Hayden Hill	2,079	21 08	63	21 71	*2,120.2	*43,828	*1,009	*1,305	*45,133	2,079	16 71	50	17 21
	Total	2,079	21 08	63	21 71	*2,120.2	*43,828	*1,009	*1,305	*45,133	2,079	16 71	50	17 21
	LOS ANGELES.													
1	Silverado	200	.....	160 00	160 00	.....	.....	24,750	32,000	32,000	200	.....	147 00	147 00
	Total	200	.....	160 00	160 00	.....	.....	24,750	32,000	32,000	200	.....	147 00	147 00

*Estimated.

MINES FOR THE YEAR ENDING MAY 31, 1880.

Bullion produced from ore raised and treated during census year.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.					Bullion produced during census year from ore previously raised.					
Gold.		Silver.		Total.		Gold.		Silver.		Total.	Gold.		Silver.		Total.	
Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Ounces.	Dollars.	Ozs.	Dolls.	Dolls.	Ounces.	Dollars.	Ozs.	Dolls.	Dollars.	
28,488.0	588,899			588,899							2,733.2	56,500			56,500	1
477.9	9,879			9,879												2
8,146.4	168,401			168,401	6,000	435.4	9,001			9,001						3
27.4	567			567	482	816.1	16,870			16,870						4
																5
23,070.1	476,901			476,901												6
2,904.4	60,040			60,040												7
2,218.5	45,860			45,860												8
65,332.7	1,350,547			1,350,547	6,482	1,251.5	25,871			25,871	2,733.2	56,500			56,500	
1,040.0	21,499			21,499												1
967.5	20,000			20,000												2
6,102.5	126,150			126,150												3
					125	731.6	15,124			15,124						4
8,707.5	180,000			180,000	2,000	580.5	12,000			12,000	48.4	1,000			1,000	5
																6
16,817.5	347,649			347,649	2,125	1,312.1	27,124			27,124	48.4	1,000			1,000	
																1
3,608.8	74,601			74,601												2
1,077.8	22,280			22,280												3
4,686.6	96,881			96,881												
3,355.3	69,360	4,040	6,011	75,371							156.7	3,239	217	281	3,520	1
3,355.3	69,360	4,040	6,011	75,371							156.7	3,239	217	281	3,520	
																1
856.2	17,699			17,699												2
160.0	3,307	108,084	140,517	143,824												3
45.4	939	13,630	17,622	18,561												4
																5
																6
		7,270	9,400	9,400												7
		5,027	6,500	6,500												8
30.6	633	14,308	18,499	19,132												9
																10
		28,726	37,140	37,140												11
141.5	2,925	2,011	2,600	5,525												12
9.7	200	1,006	1,300	1,500												13
		4,306	5,567	5,567												14
																15
																16
																17
																18
																19
1,243.4	25,703	184,908	239,145	264,848												
1,680.5	34,739	802	1,037	35,776												1
1,680.5	34,739	802	1,037	35,776												
		22,740	29,400	29,400												1
		22,740	29,400	29,400												

TABLE CXXI.—CALIFORNIA—PRODUCTION OF DEEP MINES

	County and district.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.		
			Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
		Tons.	Dollars.	Dolls.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Dolls.	Dolls.	Dolls.
	MARIPOSA.													
1	Coulterville	300	50 00	.....	50 00	725.6	15,000	.....	.....	15,000	300	37 50	.....	37 50
2	Hornitos (*g*)	12,000	15 00	.....	15 00	8,707.5	180,000	.....	.....	180,000	12,000	9 00	.....	9 00
3	Mariposa Estate (*h*)	4,360	20 62	.....	20 62	4,340.9	89,920	.....	.....	89,920	4,360	15 78	.....	15 78
	Total	16,660	17 10	.....	17 10	13,783.0	284,920	.....	.....	284,920	16,660	10 69	.....	10 69
	MONO.													
1	Bishop Creek	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2	Blind Spring (*i*)	174	1 95	249 17	251 12	16.4	339	33,533	43,355	43,694	174	1 78	243 20	245 07
3	Bodie	56,072	53 00	8 17	61 17	143,756.5	2,971,711	354,235	457,990	3,429,701	55,960	49 42	6 10	55 52
4	Clover Patch	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
5	Homer	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
6	Indian	640	.....	142 66	142 66	.....	.....	70,616	91,300	91,300	640	.....	125 50	125 50
7	Montgomery, or White Peak	300	.....	20 00	20 00	.....	.....	4,641	6,000	6,000	300	.....	16 67	16 67
8	Piute	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
9	Scattered	25	.....	*300 00	*300 00	.....	.....	*5,801	*7,500	*7,500	25	.....	264 04	264 04
	Total	57,211	51 95	10 59	62 54	143,772.9	2,972,050	468,826	606,145	3,578,195	57,108	48 44	8 33	56 77
	NAPA.													
1	Calistoga	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Total	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	NEVADA.													
1	Grass Valley	28,989	20 26	.....	20 26	28,408.7	587,260	.....	.....	587,260	28,989	15 19	.....	15 19
2	Nevada City	27,814	22 57	1 05	23 62	30,374.9	627,905	22,328	28,868	656,773	27,814	14 25	68	14 93
3	Willow Valley	1,630	40 00	.....	40 00	3,154.0	65,199	.....	.....	65,199	1,630	32 00	.....	32 00
	Total	58,433	21 91	49	22 40	61,937.6	1,280,364	22,328	28,868	1,309,232	58,433	15 21	33	15 54
	PLACER.													
1	Colfax (*j*)	3,000	25 00	.....	25 00	3,628.1	75,000	.....	.....	75,000	3,000	20 00	.....	20 00
	Total	3,000	25 00	.....	25 00	3,628.1	75,000	.....	.....	75,000	3,000	20 00	.....	20 00
	PLUMAS.													
1	Genesee Valley	400	*9 75	*25	*10 00	188.6	3,899	77	100	3,999	400	7 00	05	7 05
2	Indian Valley (*k*)	37,960	8 72	12	8 84	16,016.4	331,088	3,254	4,207	335,295	37,960	6 11	08	6 19
3	Quartz Township (*l*)	74,919	*9 21	*08	*9 29	33,386.1	*690,152	4,486	*5,800	*695,952	74,919	6 91	06	6 97
4	Seneca	600	6 29	06	6 35	182.5	3,773	31	40	3,813	600	4 72	05	4 77
	Total	113,879	9 03	09	9 12	49,773.6	1,028,912	7,848	10,147	1,039,059	113,879	6 63	06	6 69
	SAN BERNARDINO.													
1	Clark (*m*)	389	.....	193 76	193 76	.....	.....	58,297	75,372	75,372	389	.....	164 55	164 55
2	Dry Lake	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3	Silver Mountain	*100	*100 00	*82 00	*182 00	483.7	9,999	6,343	8,201	18,200	.....	.....	.....	.....
	Total	489	20 45	170 90	191 35	483.7	9,999	64,640	83,573	93,572	389	.....	164 55	164 55
	SAN DIEGO.													
1	Banner	300	40 00	.....	40 00	580.5	12,000	.....	.....	12,000	300	30 00	.....	30 00
2	Cargo Muchacho	10,000	22 00	.....	22 00	10,642.5	220,000	.....	.....	220,000	10,000	15 40	.....	15 40
3	Julian	213	*52 81	.....	*52 81	544.2	*11,250	.....	.....	*11,250	213	41 55	.....	41 55
4	Picacho	6,000	21 00	.....	21 00	6,095.2	125,999	.....	.....	125,999	6,000	11 00	.....	11 00
5	Pinecate	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Total	16,513	22 36	.....	22 36	17,862.4	369,249	.....	.....	369,249	16,513	14 40	.....	14 40
	SHASTA.													
1	French Gulch	500	*85 00	.....	*85 00	*2,055.9	*42,499	.....	.....	*42,499	*500	*77 00	.....	*77 00
2	Iron Mountain	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3	Pittsburgh	6,000	*2 50	*18 00	*20 50	*725.6	*14,999	*83,533	*108,000	*122,999	6,000	*2 00	*14 90	*16 90
4	Whiskey Creek	1,180	*44 32	.....	*44 32	*2,530.0	*52,300	.....	.....	*52,300	1,180	34 40	.....	34 40
5	Scattered	330	54 54	.....	54 54	870.8	18,001	.....	.....	18,001	*200	*20 00	.....	*20 00
	Total	8,010	*15 96	*13 48	*29 44	*6,182.3	*127,799	*83,533	*108,000	*235,799	7,880	12 08	*11 34	23 42

* Estimated.

FOR THE YEAR ENDING MAY 31, 1880—Continued.

Bullion produced from ore raised and treated during census year.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.					Bullion produced during census year from ore previously raised.					
Gold.		Silver.		Total.		Gold.		Silver.		Total.	Gold.		Silver.		Total.	
Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Ounces.	Dollars.	Ozs.	Dolls.	Dolls.	Ounces.	Dollars.	Ozs.	Dolls.	Dollars.	
544.2	11,250			11,250												1
5,224.5	108,000			108,000							25.4	525			525	2
3,328.2	68,800			68,800							6,467.7	133,699			133,699	3
9,096.9	188,050			188,050							6,493.1	134,224			134,224	
																1
14.9	308	32,743	42,333	42,641									696	900	900	2
133,801.7	2,765,927	264,038	341,375	3,107,302	103	138.1	2,855	939	1,214	4,069						3
																4
																5
		62,122	80,317	80,317												6
		3,867	5,000	5,000												7
																8
		5,105	6,601	6,601												9
133,816.6	2,766,235	367,875	475,626	3,241,861	103	138.1	2,855	939	1,214	4,069			696	900	900	
																1
21,306.5	440,445			440,445												1
19,171.2	396,303	14,737	19,053	415,356												2
2,523.2	52,159			52,159												3
43,000.9	888,907	14,737	19,053	907,960												
2,902.5	60,000			60,000							387	8,000			8,000	1
2,902.5	60,000			60,000							387	8,000			8,000	
135.4	2,799	15	20	2,819												1
11,224.6	232,033	2,206	2,852	234,885							28.1	581	5	7	588	2
25,039.6	517,614	3,364	4,349	521,963							47.1	974	8	10	984	3
136.9	2,830	23	30	2,860							2,077.4	42,943	8	10	42,953	4
36,536.5	755,276	5,608	7,251	762,527							2,152.6	44,498	21	27	44,525	
		49,540	64,050	64,050									824	1,065	1,065	1
																2
					100	483.7	9,999	6,342	8,200	18,199						3
		49,540	64,050	64,050	100	483.7	9,999	6,342	8,200	18,199			824	1,065	1,065	
435.4	9,000			9,000												1
7,449.7	154,000			154,000												2
428.1	8,850			8,850												3
3,192.8	66,000			66,000												4
																5
11,506.0	237,850			237,850												
*1,862.4	*38,500			*38,500												1
																2
*580.5	*12,000	*69,145	*89,398	*101,398							58.1	1,201	6,914	8,939	10,140	3
1,968.9	40,700			40,700												4
193.5	4,000			4,000	130	628.9	13,001			13,001						5
4,605.3	95,200	*69,145	*89,398	184,598	130	628.9	13,001			13,001	58.1	1,201	6,914	8,939	10,140	

*Estimated.

TABLE CXXI.—CALIFORNIA—PRODUCTION OF DEEP MINES

	County and district.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.		
			Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
		Tons.	Dollars.	Dolls.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Dolls.	Dolls.	Dolls.
	SISKIYOU.													
1	Quartz Valley	500	26 13	11 72	37 85	632.0	13,064	4,533	5,861	18,925	500	19 59	8 79	28 38
2	Sawyer's Bar	2,500	17 75	25	18 00	2,146.7	44,376	483	625	45,001	2,500	13 02	12	13 14
3	South Fork Salmon	19,290	*11 12	*15	*11 27	*10,375.2	*214,475	2,261	*2,845	*217,320	19,290	8 34	11	8 45
	Total	22,290	12 20	44	12 64	13,153.9	271,915	7,217	9,331	281,246	22,290	9 11	31	9 42
	TRINITY.													
1	Ballychoop	*400	*30 00	.....	*30 00	*580.5	*12,000	.....	.....	*12,000	*400	*25 00	.....	*25 00
2	Deadwood	400	*40 00	.....	*40 00	*774.0	*16,000	.....	.....	*16,000	400	30 00	.....	30 00
	Total	800	*35 00	.....	*35 00	*1,354.5	*28,000	.....	.....	*28,000	800	27 50	.....	27 50
	TUOLUMNE.													
1	Confidence	*3,000	*12 44	.....	*12 44	*1,808.3	*37,380	.....	.....	*37,380	*3,000	*10 40	.....	*10 40
2	Jamestown	2,200	*25 00	.....	*25 00	2,660.6	55,000	.....	.....	55,000	2,200	*20 00	.....	*20 00
3	Riverside	200	15 00	.....	15 00	145.1	3,000	.....	.....	3,000	200	10 00	.....	10 00
4	Sonora	3,000	8 60	.....	8 60	1,248.4	25,806	.....	.....	25,806	3,000	8 00	.....	8 00
5	Soulsbyville (*n*)	2,000	*18 00	*2 00	*20 00	*1,741.5	*36,000	*3,094	*4,000	*40,000	2,000	13 50	1 50	15 00
	Total	10,406	15 11	38	15 49	7,603.9	157,186	*3,094	*4,000	161,186	10,406	12 32	29	12 61

* Estimated.
a From tailings.
b From 500 tons tailings.
c From 27 tons ore prior to census year.
d Lead 30 per cent.
e Lead 30 per cent.=62 tons.
f Abandoned.
g From 175 tons tailings.

TABLE CXXII.—CALIFORNIA—RECAPITULATION BY COUNTIES OF

	County.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.		
			Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
		Tons.	Dolls.	Dolls.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Dolls.	Dolls.	Dolls.
1	Amador	114,018	14 62	.....	14 62	81,056.4	1,675,584	.....	.....	1,675,584	108,136	12 49	.....	12 49
2	Calaveras	42,628	10 74	.....	10 74	22,162.1	458,131	.....	.....	458,131	40,503	8 58	.....	8 58
3	El Dorado	4,520	26 76	.....	26 76	5,832.3	120,564	.....	.....	120,564	4,520	21 21	.....	21 21
4	Fresno	578	150 00	13 00	163 00	4,194.1	86,700	5,812	7,514	94,214	578	120 00	10 40	130 40
5	Inyo	6,714	5 01	69 66	74 67	1,627.0	33,633	361,779	467,744	501,377	6,714	3 83	35 62	39 45
6	Lassen	2,079	21 08	63	21 71	*2,120.2	*43,828	*1,009	*1,305	*45,133	2,079	16 71	50	17 21
7	Los Angeles	200	.....	160 00	160 00	.....	.....	24,750	32,000	32,000	200	.....	147 00	147 00
8	Mariposa	16,060	17 10	.....	17 10	13,783.0	284,920	.....	.....	284,920	16,060	10 69	.....	10 69
9	Mono	57,211	51 95	10 59	62 54	143,772.9	2,972,050	468,826	606,145	3,578,195	57,108	48 44	8 33	56 77
10	Nevada	58,433	21 91	49	22 40	61,937.6	1,280,364	22,328	28,868	1,309,232	58,433	15 21	33	15 54
11	Placer	3,000	25 00	.....	25 00	3,628.1	75,000	.....	.....	75,000	3,000	20 00	.....	20 00
12	Plumas	113,879	9 03	09	9 12	49,773.6	1,028,912	7,848	10,147	1,039,059	113,879	6 63	06	6 69
13	San Bernardino	489	20 45	170 90	191 35	483.7	9,990	64,040	83,573	93,572	389	.....	164 55	164 55
14	San Diego	16,513	22 36	.....	22 36	17,862.4	369,249	.....	.....	369,249	16,513	14 40	.....	14 40
15	Shasta	8,010	*15 96	*18 48	*29 44	*6,182.3	*127,799	*83,533	*108,000	*235,799	7,880	12 08	*11 34	23 42
16	Siskiyou	22,290	12 20	44	12 64	13,153.9	271,915	7,217	9,331	281,246	22,290	9 11	31	9 42
17	Trinity	800	*35 00	.....	*35 00	*1,354.5	*28,000	.....	.....	*28,000	800	27 50	.....	27 50
18	Tuolumne	10,406	15 11	38	15 49	7,603.9	157,186	*3,094	*4,000	161,186	10,406	12 32	29	12 61
	Total	479,028	18 84	2 84	21 68	436,528.0	9,023,834	1,050,836	1,358,027	10,382,461	470,088	16 10	2 00	18 10
	Additional production estimated from transportation statistics	*65,213	*18 84	*2 84	*21 68	59,434.1	*1,228,612	143,248	*185,205	*1,413,817	*65,213	*16 10	*2 00	*18 10
	Grand total	544,241	18 84	2 84	21 68	495,962.1	10,252,446	1,194,084	1,543,832	11,796,278	535,301	16 10	2 00	18 10

* Estimated.

FOR THE YEAR ENDING MAY 31, 1880—Continued.

Bullion produced from ore raised and treated during census year.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.					Bullion produced during census year from ore previously raised.					
Gold.		Silver.		Total.		Gold.		Silver.		Total.	Gold.		Silver.		Total.	
Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Ounces.	Dollars.	Ozs.	Dolls.	Dolls.	Ounces.	Dollars.	Ozs.	Dolls.	Dollars.	
474.0	9,798	3,400	4,306	14,104	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
1,574.6	32,550	223	288	32,838	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
7,781.4	160,856	1,650	2,134	162,990	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
9,830.0	203,204	5,273	6,818	210,022	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
*483.7	*10,000	.....	.....	*10,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
580.5	12,000	.....	.....	12,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
1,064.2	22,000	.....	.....	22,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
*1,512.2	*31,260	.....	.....	*31,260	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
*2,128.5	*44,000	.....	.....	*44,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
96.7	2,000	.....	.....	2,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
1,161.0	24,000	.....	.....	24,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4
1,306.1	27,000	2,320	3,000	30,000	.....	.....	.....	.....	.....	.....	73.1	1,511	146	189	1,700	5
6,204.5	128,260	2,320	3,000	131,260	.....	.....	.....	.....	.....	.....	73.1	1,511	146	189	1,700	

* Estimated.
h From 7,640 tons raised prior to census year.
i From 48 tons tailings.
j From 1,000 tons tailings.
k From 230 tons ore prior to census year.
l From 302 tons tailings.
m From 270 tons tailings.
n From tailings sold.

PRODUCTION OF DEEP MINES FOR THE YEAR ENDING MAY 31, 1880.

Bullion produced from ore raised and treated during census year.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.					Bullion produced during census year from ore previously raised.					
Gold.		Silver.		Total.		Gold.		Silver.		Total.	Gold.		Silver.		Total.	
Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Ounces.	Dollars.	Ozs.	Dolls.	Dolls.	Ounces.	Dollars.	Ozs.	Dolls.	Dolls.	
65,332.7	1,350,547	.....	.....	1,350,547	6,482	1,251.5	25,871	.....	.....	25,871	2,733.2	56,500	.....	.....	56,500	1
16,817.5	347,649	.....	.....	347,649	2,125	1,312.1	27,124	.....	.....	27,124	48.4	1,000	.....	.....	1,000	2
•4,686.6	96,881	.....	.....	96,881	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
3,355.3	69,360	4,649	6,011	75,371	.....	.....	.....	.....	.....	.....	156.7	3,239	217	281	3,520	4
1,243.4	25,703	184,968	239,145	264,848	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5
1,680.5	34,739	802	1,037	35,776	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6
.....	.....	22,740	29,400	29,400	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7
9,096.9	188,050	.....	.....	188,050	.....	.....	.....	.....	.....	.....	6,493.1	134,224	.....	.....	134,224	8
133,816.6	2,766,235	367,875	475,626	3,241,861	103	138.1	2,855	939	1,214	4,069	.....	.....	696	900	900	9
43,000.9	888,907	14,737	19,053	907,960	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10
2,902.5	60,000	.....	.....	60,000	.....	.....	.....	.....	.....	.....	387.0	8,000	.....	.....	8,000	11
36,536.5	755,270	5,608	7,251	762,527	.....	.....	.....	.....	.....	.....	2,152.6	44,498	21	27	44,525	12
.....	.....	49,540	64,050	64,050	100	483.7	9,999	6,342	8,200	18,199	.....	.....	824	1,065	1,065	13
11,506.0	237,850	.....	.....	237,850	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14
4,605.3	95,200	*69,145	*89,398	184,598	190	628.9	13,001	.....	.....	13,001	58.1	1,201	6,914	8,939	10,140	15
9,830.0	203,204	5,273	6,818	210,022	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	16
1,064.2	22,000	.....	.....	22,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	17
6,204.5	128,260	2,320	3,000	131,260	.....	.....	.....	.....	.....	.....	73.1	1,511	146	189	1,700	18
351,679.4	7,269,861	727,657	940,789	8,210,650	8,940	3,814.3	78,850	7,281	9,414	88,264	12,102.2	250,173	8,818	11,401	261,574	
50,790.1	*1,049,925	100,879	*130,426	*1,180,351	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
402,469.5	8,319,786	828,536	1,071,215	9,391,001	8,940	3,814.3	78,850	7,281	9,414	88,264	12,102.2	250,173	8,818	11,401	261,574	

TABLE CXXIII.—CALIFORNIA—PRODUCTION (GOLD) OF HYDRAULIC, PLACER, DRIFT, AND RIVER MINES FOR THE YEAR ENDING MAY 31, 1880.

County and district.	Gold.			
	Totals, by districts.		Totals, by counties.	
	Ounces.	Dollars.	Ounces.	Dollars.
BUTTE.				
Centerville and Helltown	725.6	15,000	15,730.3	325,174
Cherokee Flat	13,257.5	274,057		
Magalia or Dog Town	828.1	17,118		
Morris Ravine	435.4	9,000		
Oroville	483.7	9,999		
CALAVERAS.				
Mokelumne Hill	3,069.4	63,450	4,665.8	96,451
Robinson's Ferry	725.6	15,000		
Vallecito	870.8	18,001		
DEL NORTE.				
Scattered	6,208.0	128,331	6,208.0	128,331
EL DORADO.				
Scattered	*24,877.7	*514,268	*24,877.7	*514,268
HUMBOLDT.				
Gold Bluffs	1,306.1	27,000	3,724.9	77,001
Orleans Bar	2,418.8	50,001		
MONO.				
Bodie	1,219.0	25,199	1,219.0	25,199
NEVADA.				
Scattered	2,062.3	42,631	2,062.3	42,631
PLACER.				
Bath	3,144.4	65,000	13,998.2	289,368
Dutch Flat	2,128.5	44,000		
Gold Run	2,612.2	53,999		
Iowa Hill	774.0	16,000		
Michigan Bluffs	5,339.1	110,369		
PLUMAS.				
Claremont	.....	.....	7,940.0	164,259
Light's Cañon	290.2	5,999		
Moonlight Mountain	290.3	6,001		
North Fork, Feather River	4,081.7	84,376		
Seneca	340.3	7,035		
Scattered	2,943.5	60,848		
SHASTA.				
Buckeye	696.6	14,400	21,789.7	450,432
French Gulch	1,393.8	28,813		
Igo	.....	.....		
Northern Shasta County	5,201.3	107,520		
Sawmill Flat	182.8	3,779		
Shasta City	1,253.9	25,920		
Southern Shasta County	10,158.8	210,000		
Scattered	2,902.5	60,000		
SISKIYOU.				
Callahan's Ranch	3,984.7	82,371		
Cottonwood	580.5	12,000		

County and district.	Gold.			
	Totals, by districts.		Totals, by counties.	
	Ounces.	Dollars.	Ounces.	Dollars.
SISKIYOU—continued.				
Galena Hill	483.8	10,001	23,413.1	483,992
Greenhorn	657.9	13,600		
Humbug	1,870.4	38,651		
Indian Creek	712.4	14,726		
McAdam's Creek	2,419.5	50,015		
Oro Fino	943.5	19,503		
Rattlesnake Creek	314.4	6,500		
Sawyer's Bar	3,628.1	75,000		
Sciad Valley	205.1	4,240		
Scott Valley	725.6	15,000		
South Fork, Salmon River	3,773.3	78,001		
Yreka	3,104.9	64,184		
STANISLAUS.				
La Grange	3,030.7	62,650	3,030.7	62,650
TRINITY.				
Arkansas Bar			37,635.7	777,999
Ballychoop				
Boalt's Hill				
Buckeye Mountain				
Cañon Creek				
Coffee Creek				
Cox's Bar				
Douglas City				
Hay Fork				
Indian Creek	37,635.7	777,999		
Junction City				
Minersville				
New River				
Oregon Gulch				
Red Hill				
South Fork				
Taylor's Flat				
Trinity Center				
Weaver Basin				
TUOLUMNE.				
Big Oak Flat			*27,081.7	*a559,828
Chinese Camp				
Groveland				
Jacksonville	*27,081.7	*559,828		
Montezuma				
Scattered				
YUBA.				
Scattered	*50,423.6	*1,042,349	*50,423.6	*1,042,349
Total	243,806.7	5,039,932	243,806.7	5,039,932
Additional production estimated from transportation statistics, not traceable by counties	.....	.....	*171,298.3	*3,541,050
Grand total	.....	.....	415,105.0	8,580,982

* Estimated.

a Including $300,000 from "pocket" mines.

DISTRIBUTION.—Tables CXXI and CXXIII are intended to show the distribution of the production as represented by the schedules, but not the actual amount of bullion produced by each county, a considerable part of the producing mines not having been reported upon by the experts. The following table presents the best estimates of the yield by counties which the schedules, combined with transportation statistics and all other sources of information at command, and a personal knowledge of many of the localities, have made practicable. It is merely an approximation to the truth, though it is believed to be sufficiently accurate for most purposes. A faultless table of production by counties could be prepared only at an expense entirely incommensurate with its usefulness:

County.	GOLD.			Silver.	Total.	County.	GOLD.			Silver.	Total.
	Deep mines.	Placer mines.	Total.				Deep mines.	Placer mines.	Total.		
Total	$8,569,059	$8,580,982	$17,150,941	$1,082,616	$18,233,557	Mono	$2,706,235	$25,199	$2,731,434	$470,526	$3,207,960
						Nevada	1,100,000	1,750,000	2,850,000	19,053	2,869,053
Alpine	60,000		60,000		60,000	Placer	175,000	850,000	1,025,000		1,025,000
Amador	1,407,047	100,000	1,507,047		1,507,047	Plumas	820,255	248,584	1,068,839	7,278	1,076,117
Butte		450,000	450,000		450,000	Sacramento		75,000	75,000		75,000
Calaveras	435,000	145,000	580,000		580,000	San Bernardino				65,115	65,115
Del Norte		128,331	128,331		128,331	San Diego	237,850		237,850		237,850
El Dorado	96,881	514,268	611,149		611,149	Shasta	96,401	450,432	546,833	98,337	645,170
Fresno	72,599		72,599	6,202	78,801	Sierra	330,000	600,000	930,000		930,000
Humboldt		130,000	130,000		130,000	Siskiyou	203,204	483,992	687,196	6,818	694,014
Inyo	25,703		25,703	239,145	264,848	Stanislaus		100,000	100,000		100,000
Kern	125,000		125,000		125,000	Trinity	22,000	777,999	799,999		799,999
Lassen	34,780		34,780	1,037	35,776	Tuolumne	129,771	559,828	689,599	3,189	692,788
Los Angeles				29,400	29,400	Yuba		1,042,349	1,042,349		1,042,349
Mariposa	322,274		322,274		322,274	Scattered	100,000	150,000	250,000	180,426	530,426
Modoc	10,000		10,000		10,000						

NEVADA.

The production of this state shows a considerable decline, as compared with that of the preceding six years. This is not due to any general falling off in the prosperity of the mining industry of the state, but to the decrease in the yield of the leading source, the Comstock lode. From 1871 to 1879, Nevada had outranked all the other states and territories in its output of the precious metals; but in the present census year it has fallen to the third place, having been passed by both Colorado and California. With the yield of the outside districts maintained at the existing rate of production, an important discovery of ore in the Comstock would perhaps raise Nevada again to the first rank. And even without any striking new developments, there is still a reserve of low-grade ore and tailings remaining unworked, sufficient to give a large and steady product for many years to come.

In 1876 the yield of the Comstock, according to Mr. Del Mar's careful analysis, was: gold, $18,002,906; silver, $20,570,078; total, $38,572,984. During the census year the product of the whole Comstock district, including the Virginia, Gold Hill, and Devil's Gate subdistricts, the outlying veins, such as the Occidental, etc., and the yield of tailings worked at various points throughout the entire tract known as the Washoe country, was: gold, $3,109,156; silver, $3,813,174; total, $6,922,330; showing a decline of $31,650,654, or 82.06 per cent., since 1876.

The bullion product of Nevada represents an average of $44 16 gold, $112 29 silver, and $156 45 gold and silver for each square mile of its area. In this respect Nevada is surpassed by Colorado, the figures for which are $25 98 gold, $159 24 silver, and $185 22 total. But with reference to its population, Nevada, even with the reduced output, remains the richest of the mining states and territories, as its annual product, if distributed equally per capita, would give $78 51 gold, $199 63 silver, and $278 14 total to every man, woman, and child within its borders. Notwithstanding the large proportion of adult males, it will be seen that this would be a fair income for the actual working population. The Nevada mines, however, are largely owned outside the state, and although they have not, taken as a whole, been profitable during the year, the local disbursements in wages, etc., continue steadily, so that the inhabitants have a direct interest in the prosecution of work, independent of the question of ownership.

Tables CXXIV and CXXV exhibit the yield of the state in detail.

The individual returns of several leading Comstock mines are given in Table CXXVI.

TABLE CXXIV.—NEVADA—PRODUCTION OF DEEP

	County and district.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.		
			Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
		Tons.	Dolls.	Dolls.	Dolls.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Dolls.	Dolls.	Dolls.
	ELKO.													
1	Blue Jacket													
2	Columbia	2,000	1 00	65 00	66 00	96.8	2,001	100,549	130,000	132,001	2,000	82	53 34	54 16
3	Good Hope	*100		*50 00	*50 00			*3,867	*5,000	*5,000				
4	Rock Creek	*200	*10 00	*70 00	*80 00	*96.8	*2,001	*10,828	*14,000	*16,001				
5	Tuscarora	9,721	15 15	144 31	159 46	7,124.3	147,272	1,085,032	1,402,837	1,550,109	8,721	12 12	115 45	127 57
6	White Rock													
7	Scattered	*1,200	*3 00	*60 00	*63 00	*174.1	*3,599	*55,089	*72,000	*75,599	*1,000	*1 84	*50 00	*51 84
	Total	13,221	11 71	122 82	134 53	7,492.0	154,873	1,255,965	1,623,837	1,778,710	11,721	9 31	99 27	108 58
	ESMERALDA.													
1	Alum Creek													
2	Black Mountain	690		91 88	91 88			49,037	63,400	63,400	690		70 78	70 78
3	Cambridge	480	*20 44	*18	*20 62	*474.5	*9,809	*70	*90	*9,899	480	15 00	15	16 14
4	Columbus (*a*)	23,975	1 00	57 83	58 83	1,161.0	24,000	1,072,335	1,386,422	1,410,422	23,975	75	48 78	49 53
5	Dutchman Creek													
6	Esmeralda	*250	*75 00	*25 00	*100 00	907.0	18,750	4,834	6,250	25,000	250	60 00	20 00	80 00
7	Gold Mountain													
8	Lake													
9	Lida Valley	*200	*10 00	*80 00	*90 00	*96.8	*2,001	*12,375	*16,000	*18,001	*200	*7 50	*67 50	*75 00
10	Montezuma	*300		*70 00	*70 00			*16,243	*21,000	*21,000	*300		55 25	*55 25
11	Mount Grant													
12	Oneota	700		113 00	113 00			61,180	79,100	79,100	348		142 87	142 87
13	Palmetto													
14	Santa Fé													
15	Silver Peak	300	*55 00	*55 00	*110 00	*798.2	*16,500	*12,702	*16,500	*33,000	300	45 39	46 51	91 90
16	Volcano													
17	Washington													
18	Wilson	2,836	30 98	50	32 48	4,388.4	90,716	1,095	1,416	92,132	2,818	26 59	23	26 82
	Total	29,731	5 44	53 49	58 93	7,825.9	161,776	1,229,931	1,590,178	1,751,954	29,361	4 45	44 88	49 33
	EUREKA.													
1	Cortez	505		292 00	292 00			114,054	147,460	147,460	505		243 67	243 67
2	Eureka (*b*)	81,307	19 40	37 14	56 54	76,304.5	1,577,354	2,335,634	3,019,742	4,597,096	78,807	19 49	33 43	49 92
3	Secret Cañon	201		92 59	92 59			14,394	18,610	18,610	80		*141 88	*141 88
	Total	82,013	19 23	38 84	58 07	76,304.5	1,577,354	2,464,082	3,185,812	4,763,166	79,392	19 37	34 88	51 25
	HUMBOLDT.													
1	Bradshaw													
2	Buckskin													
3	Buena Vista	1,000	6 00	34 00	40 00	290.3	6,001	26,297	34,000	40,001	*1,000	*4 50	*26 00	*30 50
4	Congo	20		75 00	75 00			1,160	1,500	1,500	1		63 00	63 00
5	Mount Rose	7,250	4 64	48 31	52 95	1,029.4	33,083	270,882	350,224	383,907	7,070	3 71	38 57	42 28
6	Rebel Creek	*200	*6 00	*54 00	*60 00	*58.1	*1,201	*8,354	*10,800	*12,001	*100	*5 00	*45 00	*50 00
7	Richmond													
8	Sierra	2,973	18 00		18 00	2,588.7	53,513			53,513	2,473	13 78		13 78
9	Silver State	15		170 00	170 00			1,973	2,550	2,550				
10	Winnemucca													
	Total	11,458	8 24	34 83	43 07	4,566.5	94,398	308,666	399,074	493,472	10,644	6 14	28 49	34 63
	LANDER.													
1	Lewis	3,600		65 00	65 00			180,989	234,000	234,000	3,600		47 22	47 22
2	Reese River	*4,566		237 11	237 11			837,326	1,082,579	1,082,579	4,151		226 43	226 43
	Total	8,166		161 22	161 22			1,018,315	1,316,579	1,316,579	7,751		143 19	143 19
	LINCOLN.													
1	Bristol	*7,209		*50 00	*50 00			*278,789	*360,446	*360,446	*7,209		*45 00	*45 00
2	Eldorado	270	7 50	55 00	62 50	98.0	2,026	11,486	14,850	16,876	270	6 44	47 23	53 67
3	Ely	6,920	2 43	59 82	62 25	812.9	16,804	320,191	413,975	430,779	2,919	19	58 28	58 47
	Total	14,399	1 31	54 81	56 12	910.9	18,830	610,466	789,271	808,101	10,398	22	48 78	49 00

*Estimated.

MINES FOR THE YEAR ENDING MAY 31, 1880.

Bullion produced from ore raised and treated during census year.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.					Bullion produced during census year from ore previously raised.					
Gold.		Silver.		Total.		Gold.		Silver.		Total.	Gold.		Silver.		Total.	
Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Ozs.	Dolls.	Ounces.	Dollars.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	
																1
79.3	1,639	82,450	106,600	108,239												2
					*100			*3,867	*5,000	*5,000						3
					*200	*96.8	*2,001	*10,828	*14,000	*16,001						4
5,113.1	105,697	778,805	1,006,917	1,112,614	*1,000	*732.9	*15,150	*111,617	*144,300	*159,450						5
																6
*89.0	*1,840	*38,673	*50,000	51,840	*200	*20.0	*600	*9,282	*12,000	*12,600						7
5,281.4	109,176	899,928	1,163,517	1,272,693	*1,500	*858.7	*17,751	*135,594	*175,300	*193,050						
																1
		37,776	48,841	48,841												2
371.3	7,675	58	75	7,750												3
870.7	18,000	904,608	1,169,568	1,187,568									1,129	1,460	1,460	4
																5
725.6	15,000	3,867	5,000	20,000												6
																7
																8
72.6	*1,500	*10,442	*13,500	15,000												9
		12,820	16,575	16,575												10
																11
		38,455	49,718	49,718	352			19,351	25,019	25,019						12
																13
																14
658.6	13,614	10,794	13,955	27,569												15
																16
																17
3,625.5	74,946	498	644	75,590	18	26.1	540	6	8	548						18
6,324.3	130,735	1,019,318	1,317,876	1,448,611	370	26.1	540	19,357	25,027	25,567			1,129	1,460	1,460	
																1
		95,176	123,053	123,053												
62,803.4	1,300,122	2,037,666	2,634,499	3,934,621	2,500	1,789.9	37,000	58,000	75,000	112,000						2
		8,779	11,350	11,350	121			4,680	6,051	6,051						3
62,803.4	1,300,122	2,141,621	2,768,902	4,069,024	2,621	1,789.9	37,000	62,680	81,051	118,051						
																1
																2
*217.7	*4,500	20,110	*26,000	*30,500												3
		49	63	63	10			1,111	1,437	1,437						4
1,270.3	26,259	210,922	272,702	298,961	180	41.1	850	7,242	9,363	10,213						5
*24.2	*500	3,481	*4,500	*5,000	*100	*20.0	*599	*4,177	*5,400	*5,999						6
																7
1,648.5	34,078			34,078	*500	435.4	9,001			9,001						8
					15			1,972	2,550	2,550						9
																10
3,160.7	65,337	234,562	303,265	368,602	814	505.5	10,450	14,502	18,750	29,200						
		131,487	170,000	170,000												1
		726,952	939,876	939,876	415			*76,108	*98,400	*98,400						2
		858,439	1,109,876	1,109,876	415			*76,108	*98,400	*98,400						
																1
		250,010	324,401	324,401												
84.1	1,739	9,804	12,753	14,492												2
27.2	562	131,581	170,122	170,684	4,001	774.2	16,004	154,730	200,050	216,054						3
111.3	2,301	392,355	507,276	509,577	4,001	774.2	16,004	154,730	200,050	216,054						

* Estimated.

TABLE CXXIV.—NEVADA—PRODUCTION OF DEEP MINES

	County and district.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.		
			Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
		Tons.	Dolls.	Dolls.	Dolls.	Ounces.	Dollars.	Ounces.	Dollars	Dollars.	Tons.	Dolls.	Dolls.	Dolls.
	NYE.													
1	Ione													
2	Jet													
3	Lodi													
4	Lone Mountain													
5	Mammoth, or Ellsworth													
6	Morey	200		90 00	90 00			13,922	18,000	18,000	200		72 00	72 00
7	Philadelphia	700		67 00	67 00			36,275	46,900	46,900	700		44 80	44 80
8	San Antonio													
9	Silver Star	*600		*60 00	*60 00			27,844	36,000	36,000	*600		*50 00	*50 00
10	Sunnyside													
11	Tybo	7,800	4 00	28 00	32 00	1,509.3	31,200	168,923	218,400	249,600	7,800	3 36	23 56	26 92
12	Union	14,517	03	28 59	28 62	18.3	378	319,467	413,039	413,417	14,517	02	25 04	25 06
	Total	23,817	1 33	30 75	32 08	1,527.6	31,578	566,431	732,339	763,917	23,817	1 11	26 16	27 27
	STOREY AND LYON.													
1	The Comstock	155,986	21 78	26 49	48 27	164,350.1	3,397,418	3,196,575	4,132,851	7,530,269	155,986	19 33	19 87	36 20
2	Scattered	*5,714½	*21 00	*25 66	*46 66	5,805.0	*120,000	113,440	*146,667	*266,667	*5,714½	*15 75	*19 25	*35 00
	Total	161,700½	21 75	26 47	48 22	170,155.1	3,517,418	3,310,015	4,279,518	7,796,936	161,700½	19 31	19 85	36 16
	WHITE PINE.													
1	Cherry Creek	877	1 04	68 11	69 15	294.9	6,096	309,669	400,294	406,390	5,877	83	58 57	59 40
2	Ward	5,393		53 32	53 32			222,411	287,555	287,555	5,393		42 54	42 54
3	White Pine	277		59 91	59 91			12,847	16,610	16,610	277		47 93	47 93
	Total	11,547	53	61 00	61 53	294.9	6,096	544,867	704,459	710,555	11,547	42	50 83	51 25

* Estimated.

(a) From 31 tons raised prior to census year.

TABLE CXXV.—NEVADA—RECAPITULATION BY COUNTIES OF

	County.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.		
			Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
		Tons.	Dolls.	Dolls.	Dolls.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Dolls.	Dolls.	Dolls.
1	Elko	13,221	11 71	122 82	134 53	7,492.0	154,873	1,255,965	1,623,837	1,778,710	11,721	9 31	99 27	108 58
2	Esmeralda	29,731	5 44	53 49	58 93	7,825.9	161,776	1,229,931	1,590,178	1,751,954	29,361	4 45	44 88	49 33
3	Eureka	82,013	19 23	38 84	58 07	76,304.5	1,577,354	2,464,082	3,185,812	4,763,166	79,392	16 37	34 88	51 25
4	Humboldt	11,458	8 24	34 83	43 07	4,566.5	94,398	308,666	399,074	493,472	10,644	6 14	28 49	34 63
5	Lander	8,166		161 22	161 22			1,018,315	1,316,579	1,316,579	7,751		143 19	143 19
6	Lincoln	14,399	1 31	54 81	56 12	910.9	18,830	610,466	789,271	808,101	10,398	22	48 78	49 00
7	Nye	23,817	1 33	30 75	32 08	1,527.6	31,578	566,431	732.339	763,917	23,817	1 11	26 16	27 27
8	Storey and Lyon	161,700½	21 75	26 47	48 22	170,155.1	3,517,418	3,310,015	4,279,518	7,796,936	161,700	19 31	19 85	36 16
9	White Pine	11,547	53	61 00	61 53	294.9	6,096	544,867	704,459	710,555	11,547	42	50 83	51 25
	Total	356,052½	15 62	41 06	56 68	269,077.4	5,562,323	11,308,738	14,621,067	20,183,390	346,331	12 35	33 47	45 82

FOR THE YEAR ENDING MAY 31, 1880—Continued.

Bullion produced from ore raised and treated during census year.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.					Bullion produced during census year from ore previously raised.				
Gold.		Silver.		Total.		Gold.		Silver.		Total.	Gold.		Silver.		Total.
Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Ozs.	Dolls.	Ounces.	Dollars.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.
															1
															2
															3
															4
															5
		11,138	14,400	14,400											6
		24,255	31,360	31,360									6,932	8,962	8,962	7
															8
		23,204	30,000	30,000											9
															10
1,267.8	26,208	142,155	183,792	210,000											11
16.2	335	281,131	363,474	363,809											12
1,284.0	26,543	481,883	623,026	649,569									6,932	8,962	8,962	
123,262.6	2,548,064	2,307,432	3,099,639	5,647,703							*27,142.6	*561,087	*551,886	*713,535	*1,274,622	1
*4,353.8	*90,001	*85,080	*110,000	*200,001												2
127,616.4	2,638,065	2,482,512	3,209,639	5,847,704							*27,142.6	*561,087	*551,886	*713,535	*1,274,622	
235.9	4,877	266,222	344,199	349,076												1
		177,444	229,418	229,418												2
		10,278	13,288	13,288									89,721	116,000	116,000	3
235.9	4,877	453,944	586,905	591,782									89,721	116,000	116,000	

*Estimated.

(b) About one-half the product of Eureka district is calculated from statements covering a fiscal year ending four months later than the census year. This does not materially impair the accuracy of the figures quoted, as the output for the district is remarkably steady.

PRODUCTION OF DEEP MINES FOR THE YEAR ENDING MAY 31, 1880.

Bullion produced from ore raised and treated during census year.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.					Bullion produced during census year from ore previously raised.				
Gold.		Silver.		Total.		Gold.		Silver.		Total.	Gold.		Silver.		Total.
Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Ozs.	Dolls.	Ounces.	Dollars.	Dollars.	Ounces.	Dollars.	Ozs.	Dollars.	Dollars.
5,281.4	109,176	899,928	1,163,517	1,272,693	*1,500	*858.7	*17,751	*135,504	*175,809	*193,060						1
6,324.3	130,735	1,019,318	1,317,876	1,448,611	370	26.1	540	19,357	25,027	25,567			1,129	1,460	1,460	2
62,893.4	1,300,122	2,141,621	2,768,902	4,069,024	2,621	1,789.9	37,000	62,689	81,051	118,051						3
3,160.7	65,337	234,562	303,265	368,602	814	505.5	10,450	14,502	18,750	29,200						4
		858,439	1,109,876	1,109,876	415			*76,108	*98,400	*98,400						5
111.3	2,301	392,355	507,276	509,577	4,001	774.2	16,004	154,730	200,050	216,054						6
1,284.0	26,543	481,883	623,026	649,569									6,932	8,962	8,962	7
127,616.4	2,638,065	2,482,512	3,209,639	5,847,704							27,142.6	*561,087	551,886	*713,535	*1,274,622	8
235.9	4,877	453,944	586,905	591,782									89,721	116,000	116,000	9
206,907.4	4,277,156	8,964,562	11,590,282	15,867,438	9,721	3,954.4	81,745	462,980	598,587	680,332	27,142.6	*561,087	649,668	*839,957	*1,401,044	

*Estimated.

TABLE CXXVI.—PRODUCTION OF LEADING COMSTOCK MINES.

Month.	Consolidated Virginia mine.		California mine.		* Union Consolidated mine.				†Ophir mine.				‡Sierra Nevada mine.
	Ore milled.	Bullion produced.	Ore milled.	Bullion produced.	Ore milled.	Bullion produced.			Ore milled.	Bullion produced.			Bullion shipped.
						Gold.	Silver.	Total.		Gold.	Silver.	Total.	
1879.	*Tons.*	*Dollars.*	*Tons.*	*Dollars.*	*Tons.*	*Dollars.*	*Dollars.*	*Dollars.*	*Tons.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*
June	3,466.5	127,007 81	5,103.5	185,063 10	.....	.....	.....	.....	1,311.45	30,064 47	42,992 78	73,057 25	60,388 77
July	4,745.5	189,303 08	4,454.5	108,739 63	.....	.....	.....	.....	1,529.00	55,711 00	52,879 03	108,590 72	101,860 94
August	4,730.0	160,215 03	4,411.0	101,107 73	.....	.....	.....	.....	1,716.00	40,106 20	48,430 40	88,626 60	45,347 70
September	4,072.0	109,020 81	4,228.0	124,605 78	.....	.....	.....	.....	1,730.00	41,277 70	55,094 46	96,372 25	.....
October	4,113.0	158,476 52	3,573.0	67,840 37	.....	.....	.....	.....	1,406.75	40,238 37	60,615 58	115,853 95	.....
November	4,859.0	198,359 56	4,141.0	125,772 28	.....	.....	.....	.....	1,536.65	41,184 14	61,735 28	102,919 42	.....
December	4,074.0	169,503 65	3,526.0	101,205 77	5,200.75	144,965 25	132,318 38	277,283 63	1,340.05	19,633 86	28,812 41	48,446 27	.....
1880.													
January	5,209.0	194,222 13	5,391.0	164,106 71	3,336.00	61,223 69	54,493 93	115,717 62	1,658.00	26,343 42	34,323 27	60,666 69	14,545 28
February	4,230.0	128,168 72	2,220.0	39,930 02	4,750.00	98,927 23	98,805 07	197,822 30	1,600.00	27,398 61	31,348 49	58,747 10	31,843 85
March	4,338.0	151,386 01	1,188.0	28,411 80	9,003.15	169,210 89	191,586 91	360,806 80	951.80	7,929 20	10,083 11	18,012 40	.....
April	4,607.5	173,642 25	2,492.5	60,004 76	5,015.88	61,125 47	91,166 17	152,291 64	755.20	8,088 10	10,347 98	19,036 17	.....
May	5,830.5	205,778 01	2,169.5	55,334 54	2,713.22	31,004 06	30,877 26	70,881 32	228.55	3,950 60	5,028 04	8,978 64	.....
Total	54,884.0	1,965,083 58	42,988.0	1,253,923 39	30,010.00	566,465 50	608,337 72	1,174,803 31	15,890.05	352,516 72	448,290 83	800,807 55	253,986 60

* Milled at the Brunswick and Morgan mills. † All treated at the Trench mill. ‡ All ore during census year treated at Mariposa mill.

PLACER MINES.—The placer yield of Nevada is insignificant. No important gravel deposits having suitable water supply are known to exist. The ground worked is in most cases merely the wash from the croppings of quartz veins. Operations are conducted on a small scale at Tuscarora, Tulé Cañon, points in the neighborhood of the Comstock, and in a few other isolated spots. The aggregate yield for the year is estimated roundly at $50,000.

CORRELATIVE STATISTICS.—There is a state bullion tax in Nevada, but in no other state or territory. The assessor's rolls, prepared in collecting this tax, furnish interesting comparative data, which have been condensed into the following abstracts. The periods selected for comparison correspond with the United States fiscal year (ending June 30, 1880). The discrepancies between the census figures and those obtained from the assessor's rolls are mainly due to the natural undervaluation attending the collection of information for the purpose of taxation, and the escape of many small amounts from enrollment altogether; and in a less degree to the fact that the United States fiscal year is one month later than the census year.

TABLE CXXVII.—TAXED PRODUCT OF THE NEVADA MINES.

[From reports of the state controller, containing abstract statements of the quarterly assessment rolls for the years 1879 and 1880.]

County.		THIRD QUARTER, 1879.				FOURTH QUARTER, 1879.			
		Quantity worked.		Gross yield or value.	Net yield or value on which tax is levied.	Quantity worked.		Gross yield or value.	Net yield or value on which tax is levied.
		Tons.	Pounds.			Tons.	Pounds.		
Elko	Ores	5,872	.....	$454,558 96	$288,755 12	3,307	900	$164,462 76	$41,601 99
Esmeralda	do	5,319	1,138	209,037 00	20,300 81	6,177	1,032	279,666 39	132,047 18
Eureka	do	25,283	196	902,079 81	304,000 00	23,015	700	822,196 79	278,081 76
Humboldt	do	2,465	.....	58,086 00	18,044 41	4,223	138	134,051 67	55,264 28
Lander	do	1,766	1,297	178,380 13	60,873 51	1,351	1,653	122,927 18	52,218 92
Lincoln	do	5,724	1,758	158,277 02	36,366 24	4,455	479	125,579 37	23,883 27
Nye	do	5,648	94	145,281 18	6,055 00	6,676	1,371	184,507 64	37,816 51
Storey	do	34,810	1,000	1,130,145 54	376,063 96	41,148	250	1,593,328 30	656,542 12
White Pine	do	7,020	682	242,565 50	67,300 93	1,107	1,250	60,953 61	7,362 67
Total ores		93,910	165	3,479,011 14	1,107,866 07	91,642	1,833	3,487,763 71	1,285,718 10
Humboldt	Tailings	500	.....	3,100 00	600 00	780	.....	3,400 00	675 00
Lyon	do	6,733	.....	28,724 60	5,449 87	7,635	.....	80,361 90	11,001 80
Nye	do	20,206	.....	251,837 11	123,804 66	16,410	.....	140,656 78	63,852 33
Storey	do	15,355	.....	126,022 40	37,776 68	6,806	.....	34,628 40	8,514 88
White Pine	do	3,267	.....	11,936 02	2,788 42	7,069	.....	33,365 68	5,089 68
Total tailings		55,121	.....	421,020 22	170,500 63	38,700	.....	250,812 76	90,033 69

TABLE CXXVII.—TAXED PRODUCT OF THE NEVADA MINES—Continued.

County.		FIRST QUARTER, 1880.				SECOND QUARTER, 1880.			
		Quantity worked.		Gross yield or value.	Net yield or value on which tax is levied.	Quantity worked.		Gross yield or value.	Net yield or value on which tax is levied.
		Tons.	Pounds.			Tons.	Pounds.		
Elko	Ores	1,500	.....	$95,739 75	$22,245 90	1,556	1,500	$51,457 51	$7,083 01
Esmeralda	do	7,262	607	278,877 05	115,280 06	8,681	.....	277,985 63	80,853 08
Eureka	do	23,532	1,044	885,768 91	304,197 11	20,044	166	891,492 12	320,038 33
Humboldt	do	3,411	200	97,408 00	35,724 38	4,111	371	82,343 15	23,678 52
Lander	do	1,472	1,942	138,433 14	53,923 76	1,251	806	140,188 30	58,971 79
Lincoln	do	2,321	1,623	64,226 18	7,853 72	1,440	1,510	50,670 26	9,512 22
Nye	do	6,155	1,430	122,864 72	9,758 67	5,509	270	128,328 82	12,580 05
Storey	do	49,113	1,350	1,019,820 07	589,087 08	38,846	.....	1,138,971 16	372,826 33
White Pine	do	1,101	750	55,059 90	9,028 20	1,351	1,511	61,353 30	6,446 24
Total ores		95,871	1,546	3,358,197 72	1,148,599 48	83,092	134	2,822,709 25	901,589 57
Humboldt	Tailings	560	.....	2,900 00	840 00	2,496	30	18,629 00	8,565 26
Lincoln	do	150	.....	1,050 00	105 00	864	225	8,469 79	1,178 79
Lyon	do	25,754	.....	101,435 77	17,432 48	22,946	.....	134,432 37	38,200 78
Ormsby	do	7,912	.....	66,732 81	27,693 01	13,185	.....	112,440 38	44,115 19
Storey	do	.....	.....	.....	.....	6,179	.....	43,241 45	10,311 13
White Pine	do	5,698	.....	21,585 51	2,158 55	7,030	.....	24,420 22	2,442 00
Total tailings		40,074	.....	193,704 09	48,229 04	52,700	255	341,733 21	104,813 15

Summary of the taxed product of the Nevada mines.

County.		Quantity worked.		Gross yield or value.	Net yield or value on which tax is levied.
		Tons.	Pounds.		
Elko	Ores	12,326	460	$766,218 08	$360,286 02
Esmeralda	do	27,440	777	1,045,566 07	357,481 13
Eureka	do	92,775	706	3,502,137 63	1,217,117 29
Humboldt	do	14,210	709	371,888 82	133,311 59
Lander	do	5,842	1,608	570,028 75	234,987 98
Lincoln	do	13,942	1,370	308,761 83	77,015 45
Nye	do	23,089	1,165	581,072 30	66,810 23
Storey	do	163,027	600	5,482,265 07	1,995,420 09
White Pine	do	10,671	193	419,032 31	90,743 44
Total ores		365,125	1,678	13,147,771 82	4,533,773 22
Humboldt	Tailings	4,390	30	28,029 00	10,080 26
Lincoln	do	1,014	225	9,519 79	1,283 79
Lyon	do	63,068	.....	305,954 73	72,984 93
Ormsby	do	66,713	.....	571,067 08	250,555 19
Storey	do	28,340	.....	203,992 25	56,002 69
White Pine	do	23,064	.....	91,307 43	12,478 65
Total tailings		186,595	255	1,207,870 28	413,585 51

UTAH.

The bullion product of Utah is remarkably steady, varying latterly but little from year to year. This territory presents facilities for arriving at a true valuation of the product which are wanting in many other mining localities. The mines are more concentrated, the yield coming from a comparatively few but rich claims, and the bulk of the ore is treated by a few large smelting works and mills, where accurate accounts are kept. It is therefore easier to collect full statistics of the product than in regions where the bullion is derived from a vast number of sources, each one of which furnishes only a small quota, as is the case where placer-mining forms an important factor. The census figures for Utah are also the more reliable from the fullness and clearness with which the schedules were prepared by the special expert for the territory.

The tabulation of the product is based on returns from 535 deep mines, 1 placer mine, 18 amalgamating mills, 34 smelting works, and 10 miscellaneous metallurgical establishments, consisting of sampling, concentration, and leaching works. Many of these sources were, however, unproductive during the census year.

Table CXXVIII shows the amount of ore raised in the several districts, with the bullion product, so far as traceable by districts. The table includes a statement of ore sold, with the price. The larger part of the bullion here stated is from milling ores. The silver-lead ores sold to the smelters are in many cases transported for reduction out of the district in which they were raised; and as their identity is lost in the mixture of ores from all portions of the territory, and even from other states and territories, it is impossible to segregate the bullion yield by districts.

TABLE CXXVIII.—UTAH—PRODUCTION OF DEEP MINES

[Ore raised is stated in gross tons. The assay value is of the net tons.

	County and district.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated (in same district).	Average yield per ton.		
			Gold.	Silver.	Gold and Silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and Silver.
		Tons.	Dolls.	Dolls.	Dolls.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Dolls.	Dolls.	Dolls.
	BEAVER.													
1	Bradshaw	1,771.75	4 81	22 25	27 06	412.4	8,525	30,497	39,430	47,955	1,771.75	4 81	18 03	22 84
2	San Francisco (*a*)	16,994.00	.....	50 04	50 04	.....	.....	657,730	850,379	850,379	16,244.00	.....	30 22	30 22
3	Star	900.00	.....	5 00	5 00	.....	.....	3,481	4,500	4,500	.....	.....	.....	.....
	Total	19,665.75	43	45 47	45 90	412.4	8,525	691,708	894,309	902,834	18,015.75	42	37 14	37 56
	JUAB.													
1	Tintic	6,256.00	15 05	38 60	53 65	4,554.3	94,146	186,805	241,520	335,666	3,548.00	16 98	3 15	20 13
	Total	6,256.00	15 05	38 60	53 65	4,554.3	94,146	186,805	241,520	335,666	3,548.00	16 98	3 15	20 13
	PIUTE.													
1	Mount Baldy	130.00	40 72	105 92	146 64	256.1	5,294	10,650	13,770	19,064	.....	.....	.....	.....
	Total	130.00	40 72	105 92	146 64	256.1	5,294	10,650	13,770	19,064	.....	.....	.....	.....
	SALT LAKE.													
1	Big Cottonwood (*b*)	1,575.50	.....	72 34	72 34	.....	.....	88,150	113,969	113,969	.....	.....	.....	.....
2	Little Cottonwood (*c*)	6,324.50	1 39	57 73	59 12	426.2	8,810	282,376	365,084	373,894	.....	.....	.....	.....
3	West Mountain (gold mines)	12,000.00	11 58	1 75	13 33	6,724.1	138,999	16,243	21,001	160,000	12,000.00	9 69	53	10 22
4	West Mountain (silver-lead mines) (*d*)	32,606.00	45	17 50	17 95	715.4	14,789	441,222	570,456	585,245	.....	.....	.....	.....
	Total	52,506.00	3 09	20 39	23 48	7,865.7	162,598	827,991	1,070,510	1,233,108	12,000.00	9 69	53	10 22
	SUMMIT.													
1	Uinta	16,918.33	.....	126 12	126 12	.....	.....	1,650,400	2,133,802	2,133,802	12,508.00	.....	97 04	97 04
2	.....*do*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Total	16,918.33	.....	126 12	126 12	.....	.....	1,650,400	2,133,802	2,133,802	12,508.00	.....	97 04	97 04
	TOOELE.													
1	Camp Floyd	1,400.00	.....	19 00	19 00	.....	.....	20,574	26,600	26,600	200.00	.....	37 50	37 50
2	Ophir (*f*)	1,887.20	.....	156 08	156 08	.....	.....	227,826	294,556	294,556	50.00	.....	20 00	20 00
3	Rush Valley (*f*)	4,032.00	.....	23 80	23 80	.....	.....	74,230	95,972	95,972	.....	.....	.....	.....
	Total	7,319.20	.....	56 99	56 99	.....	.....	322,630	417,128	417,128	250.00	.....	34 00	34 00
	UTAH.													
1	American Fork	1,836.50	.....	28 73	28 73	.....	.....	40,810	52,763	52,763	.....	.....	.....	.....
2	Silver Lake (*g*)	121.00	....	74 99	74 99	.....	.....	7,018	9,074	9,074	.....	.....	.....	.....
	Total	1,957.50	.....	31 59	31 59	.....	.....	47,828	61,837	61,837	.....	.....	.....	.....
	WASHINGTON.													
1	Harrisburg, or Silver Reef	49,895.00	.....	26 71	26 71	.....	.....	1,030,744	1,332,649	1,332,649	46,795.00	.....	21 66	21 66
	Total	49,895.00	.....	26 71	26 71	.....	.....	1,030,744	1,332,649	1,332,649	46,795.00	.....	21 66	21 66
1	Scattered	*180.00	....	*77 57	*77 57	.....	.....	*10,800	*13,963	*13,963	.....	.....	.....	.....

* Estimated.
a Moisture 3 per cent. *b* Moisture 7½ per cent. *c* Moisture 10 per cent. *d* Moisture 6½ per cent. *f* Moisture 7 per cent. *g* Moisture 8 per cent.

TABLE CXXIX.—UTAH—RECAPITULATION BY COUNTIES OF

	County.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated in the same counties).	Average yield per ton.		
			Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
		Tons.	Dolls.	Dolls.	Dolls.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Dolls.	Dolls.	Dolls.
1	Beaver	19,665.75	43	45 47	45 90	412.4	8,525	691,708	894,309	902,834	18,015.75	42	37 14	37 56
2	Juab	6,256.00	15 05	38 60	53 65	4,554.3	94,146	186,805	241,520	335,666	3,548.00	16 98	3 15	20 13
3	Piute	130.00	40 72	105 92	146 64	256.1	5,294	10,650	13,770	19,064	.....	.....	.....	.....
4	Salt Lake	52,506.00	3 09	20 39	23 48	7,865.7	162,598	827,991	1,070,510	1,233,108	12,000.00	9 69	53	10 22
5	Summit	16,918.33	.....	126 12	126 12	.....	.....	1,650,400	2,133,802	2,133,802	12,508.00	.....	97 04	97 04
6	Do	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
7	Tooele	7,319.20	.....	56 99	56 99	.....	.....	322,630	417,128	417,128	250.00	.....	34 00	34 00
8	Utah	1,957.50	.....	31 59	31 59	.....	.....	47,828	61,837	61,837	.....	.....	.....	.....
9	Washington	49,895.00	.....	26 71	26 71	.....	.....	1,030,744	1,332,649	1,332,649	46,795.00	.....	21 66	21 66
10	Scattered	*180.00	.....	*77 57	*77 57	.....	.....	*10,800	*13,963	*13,963	.....	.....	.....	.....
	Total (*a*)	154,827.78	1 75	39 91	41 66	13,088.5	270,563	4,779,556	6,179,488	6,450,051	93,116.75	1 98	31 38	33 36

* Estimated.
a Including only the product which could be segregated by counties. The balance, not thus traceable, is added in the recapitulation for the United States, bringing the corresponding figures up to $270,045 gold, $4,596,954 silver, and $4,866,999 total.

FOR THE YEAR ENDING MAY 31, 1880.

Percentage of moisture is attached to each district where important.]

Bullion produced from ore raised and treated during census year, as traced by districts.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.					Bullion produced during census year from ore previously raised.					Ore sold.	Cash receipts for ore sold. (Bullion accounted for in returns of smelting works.)		
Gold.		Silver.		Total.		Gold.		Silver.		Total.	Gold.		Silver.		Total.		Aver'ge price per ton.	Total receipts.	
Ozs.	Dolls.	Ounces.	Dollars.	Dollars.	Tons.	Ozs.	Dolls.	Ozs.	Dolls.	Dolls.	Ozs.	Dolls.	Ozs.	Dolls.	Dolls.	Tons.	Dolls.	Dolls.	
369.5	7,638	24,703	31,939	39,577	.....	.....	.....	.....	.....	.....	74.6	1,542	4,984	6,444	7,986	.....	.....	.....	1
.....	.....	492,760	637,089	637,089	750	.....	.....	30,000	38,787	38,787	.....	.....	.....	.....	.....	.....	.....	.....	2
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	900.00	8 00	7,200	3
369.5	7,638	517,463	669,028	676,666	750	.....	.....	30,000	38,787	38,787	74.6	1,542	4,984	6,444	7,986	900.00	8 00	7,200	
2,914.0	60,238	8,663	11,200	71,438	450	135.5	2,801	5,260	6,800	9,601	.....	.....	.....	.....	.....	2,258.00	45 11	102,860	1
2,914.0	60,238	8,663	11,200	71,438	450	135.5	2,801	5,260	6,800	9,601	.....	.....	.....	.....	.....	2,258.00	45 11	102,860	
.....	.....	.....	.....	.....	50	.....	.....	1,547	2,000	2,000	.....	.....	.....	.....	.....	80.00	98 06	7,845	1
.....	.....	.....	.....	.....	50	.....	.....	1,547	2,000	2,000	.....	.....	.....	.....	.....	80.00	98 06	7,845	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,575.50	53 87	84,881	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6,324.50	47 65	301,395	2
5,627.4	116,329	4,880	6,309	122,638	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
.....	.....	.....	.....	.....	2,650	29.0	600	26,500	34,262	34,862	.....	.....	.....	.....	.....	29,956.00	15 86	475,513	4
5,627.4	116,329	4,880	6,309	122,638	2,650	29.0	600	26,500	34,262	34,862	.....	.....	.....	.....	.....	37,856.00	22 76	861,789	
.....	.....	938,762	1,213,725	1,213,725	3,845	.....	.....	370,269	478,720	478,720	.....	.....	107,911	139,518	139,518	565.33	13 13	7,420	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	300.00	40 00	c12,000	2
.....	.....	938,762	1,213,725	1,213,725	3,845	.....	.....	370,269	478,720	478,720	.....	.....	107,911	139,518	139,518	865.33	53 13	19,420	
.....	.....	5,801	7,500	7,500	1,200	.....	.....	12,839	16,600	16,600	.....	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	774	1,001	1,001	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,837.20	123 27	226,472	2
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,032.00	17 23	69,475	3
.....	.....	6,575	8,501	8,501	1,200	.....	.....	12,839	16,600	16,600	.....	.....	.....	.....	.....	5,869.20	50 42	295,947	
.....	.....	.....	.....	.....	100	.....	.....	3,867	5,000	5,000	.....	.....	.....	.....	.....	1,736.50	27 90	48,450	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	121.00	55 25	6,685	2
.....	.....	.....	.....	.....	100	.....	.....	3,867	5,000	5,000	.....	.....	.....	.....	.....	1,857.50	29 68	55,135	
.....	.....	784,065	1,013,718	1,013,718	3,100	.....	.....	57,227	73,989	73,989	.....	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	784,065	1,013,718	1,013,718	3,100	.....	.....	57,227	73,989	73,989	.....	.....	.....	.....	.....	.....	.....	.....	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	*180.00	*60 00	*10,800	1

* Estimated.

c For 300 tons of concentrations from 5,100 tons tailings.

PRODUCTION OF DEEP MINES FOR THE YEAR ENDING MAY 31, 1880.

Bullion produced from ore raised and treated during census year, as traced by counties.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.					Bullion produced during census year from ore previously raised.					Ore sold.	Cash receipts for ore sold. (Bullion accounted for in returns of smelting works.)		
Gold.		Silver.		Total.		Gold.		Silver.		Total.	Gold.		Silver.		Total.		Aver'ge price per ton.	Total receipts.	
Ozs.	Dolls.	Ounces.	Dollars.	Dollars.	Tons.	Ozs.	Dolls.	Ozs.	Dolls.	Dolls.	Ozs.	Dolls.	Ozs.	Dolls.	Dolls.	Tons.	Dolls.	Dolls.	
369.5	7,638	517,463	669,028	676,666	750	.....	.....	30,000	38,787	38,787	74.6	1,542	4,984	6,444	a7,986	900.00	8 00	7,200	1
2,914.0	60,238	8,663	11,200	71,438	450	135.5	2,801	5,260	6,800	9,601	.....	.....	.....	.....	.....	2,258.00	45 11	102,860	2
.....	.....	.....	.....	.....	50	.....	.....	1,547	2,000	2,000	.....	.....	.....	.....	.....	80.00	98 06	7,845	3
5,627.4	116,329	4,880	6,309	122,638	2,650	29.0	600	26,500	34,262	34,862	.....	.....	.....	.....	.....	37,856.00	22 76	861,789	4
.....	.....	938,762	1,213,725	1,213,725	3,845	.....	.....	370,269	478,720	478,720	.....	.....	107,911	139,518	139,518	565.33	13 13	7,420	5
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	300.00	40 00	b12,000	6
.....	.....	6,575	8,501	8,501	1,200	.....	.....	12,839	16,600	16,600	.....	.....	.....	.....	.....	5,869.20	50 42	295,947	7
.....	.....	.....	.....	.....	100	.....	.....	3,867	5,000	5,000	.....	.....	.....	.....	.....	1,857.50	29 68	55,135	8
.....	.....	784,065	1,013,718	1,013,718	3,100	.....	.....	57,227	73,989	73,989	.....	.....	.....	.....	.....	.....	.....	.....	9
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	*180.00	*60 00	*10,800	10
8,910.9	184,205	2,260,408	2,922,481	3,106,686	12,145	164.5	3,401	507,509	656,158	659,559	74.6	1,542	112,895	145,962	147,504	49,866.03	27 29	1,360,996	

* Estimated.

a From 357.5 tons raised prior to census year.

b For 300 tons concentrations.

In Table CXXVIII, and in the one following, Table CXXIX, which gives the yield by counties, the ore is stated in gross tons, and the assay value and yield is of net tons, the amount of moisture being noted in the district table where important. The following is an exhibit of the proportionate amounts of ore milled and ore smelted:

TABLE CXXX.—UTAH—STATEMENT OF ORE MILLED AND SMELTED.

County.	District.	Ore milled.	Ore smelted.	Total ore treated.	Percentage of ore milled.	Percentage of ore smelted.
		Tons.	Tons.	Tons.		
Beaver	Bradshaw		1,771.75			100
Do	San Francisco		16,244.00			100
Do	Star		900.00	18,915.75		100
Juab	Tintic	3,548	2,258.00	5,806.00	61	39
Piute	Mount Baldy		80.00	80.00		100
Salt Lake	Big Cottonwood		1,575.50			100
Do	Little Cottonwood		6,324.50			100
Do	West Mountain (gold mines)	12,000			100	
Do	West Mountain (silver-lead mines)		29,050.00	49,850.00		100
Summit	Uinta	12,508	565.33	13,073.33		100
Tooele	Camp Floyd	200			100	
Do	Ophir	50	1,837.20		3	97
Do	Rush Valley		4,032.00	6,119.20		100
Utah	American Fork		1,736.50			100
Do	Silver Lake		121.00	1,857.50		100
Washington	Harrisburg or Silver Reef	46,795		46,795.00	100	
Scattered			180.00	180.00		100
Total		75,101	67,581.78	142,082.78	53	47

The most noticeable feature shown in the foregoing table is the large proportion of milling ore which Utah furnishes, compared with her base ores, although a territory generally supposed to be dependent upon her smelting works. It should be noted, also, that of the ore smelted there was a considerable amount which might have been treated by amalgamation, but which, because of the absence of proper milling facilities, or because of unusual richness, it was advisable to sell to the smelters. But while the percentage by weight of ore milled was 53 per cent., as against 47 per cent. for ores smelted, the same proportion does not hold with regard to value, the percentage of bullion extracted being only 51.08 per cent. for the product of amalgamating mills, as against 48.92 per cent. for that from the smelting works—a nearly even ratio. This difference is accounted for by the fact, that as a rule, the ores smelted, on account of the greater expense usually involved, are richer than the ores which will bear the milling expense, and also because of the higher proportion of the assay contents of the ore extracted by the smelting process, as compared with the milling results. The following analysis of the total bullion product of the territoy shows the relative amounts coming from each source:

TABLE CXXXI.—UTAH—ANALYSIS OF PRODUCT.

Classification of source.	Gold.	Silver.	Total.
Amalgamating mills, from ore raised during census year	$175,024	$2,247,009	$2,422,033
Amalgamating mills, from ore raised prior to census year		139,518	139,518
Total from mills	175,024	2,386,527	2,561,551
Smelting-works, from ore raised during census year	94,089	2,349,948	2,444,037
Smelting-works, from ore raised prior to census year	1,542	6,444	7,986
Total from smelting-works	96,631	2,356,392	2,452,023
Total from mills and smelting-works	271,655	4,742,919	5,014,474
Placer mines	20,000		20,000
Total	291,655	4,742,919	5,034,474

The average product of the Utah milling ores and ores smelted, and the average yield of all the Utah ore reduced by either process during the census year, was as follows:

TABLE CXXXII.—UTAH—COMPARATIVE RESULTS OF TREATMENT.

Metal.	Average yield of—		
	Ores milled.	Ores smelted.	All ore treated.
Gold, per ton	$2 33	$1 40	$1 90
Silver, per ton	29 92	34 78	33 24
Total	32 25	36 18	35 14

The next table shows the base bullion product of the Utah smelting works, with the precious-metal contents. It includes the yield of ores sent from Idaho, Montana, and Nevada to the Utah smelters, and also the product of a small quantity of ore which was raised prior to the census year.

TABLE CXXXIII.—UTAH—BASE BULLION PRODUCTION OF SMELTING WORKS FOR THE YEAR ENDING MAY 31, 1880.

County.	Refined lead.	Crude bullion, including weight of silver and gold contents.	Precious metals contained in base bullion.				
			Gold.		Silver.		Total.
	Pounds.	Pounds.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.
Beaver	.....	8,312,957	444.1	9,180	522,447	675,472	684,652
Salt Lake	2,586,370	16,781,778	3,731.4	77,135	1,159,583	1,499,225	1,576,360
Tooele	.....	3,118,766	335.9	6,944	131,876	170,502	177,446
Total	2,586,370	28,213,501	4,511.4	93,259	1,813,906	2,345,199	2,438,458

Deducting from the crude bullion product 322,170 pounds, produced from Idaho, Montana, and Nevada ores smelted in Utah, the remainder, 27,891,331 pounds, is the yield of Utah ores smelted in the Territory. To this should be added 865,500 pounds of crude lead bullion, the estimated yield of Utah ores smelted in Chicago and in Omaha. The total crude bullion product of Utah for the census year is, therefore, 28,756,831 pounds.

The gross precious metal product of the Utah smelting works, given in the preceding table, is segregated as follows:

TABLE CXXXIV.—UTAH—PRODUCT OF ORES SMELTED IN UTAH DURING CENSUS YEAR.

Product.			Gold bullion.		Silver bullion.		Total.
			Ounces.	Dollars.	Ounces.	Dollars.	Dollars.
Product of smelting works (precious metals contained in base bullion)			4,511.4	93,259	1,813,906	2,345,199	2,438,458
Deduct product of Beaver county smelting works (accounted for in Table VIII)			444.1	9,180	522,447	675,472	684,652
Product of smelting works, less product of Beaver county smelting works			4,067.3	84,079	1,291,459	1,669,727	1,753,806
From this deduct:	*Ounces.*	*Dollars.*					
Product of Nevada ores smelted in Utah (*a*)	14,994	*a*19,386	.....	.....	.....	.....	.....
Product of Idaho ores smelted in Utah (*b*)	16,916	*b*21,871	.....	.....	.....	.....	.....
Product of Montana ores smelted in Utah (*c*)	5,116	*c*6,614	.....	.....	.....	.....	.....
Product of Nevada sulphides from leaching works	15,469	20,000	.....	.....	.....	.....	.....
Total	52,495	67,871	.....	.....	52,495	67,871	67,871
Net product of Utah ores smelted in Utah during census year			4,067.3	84,079	1,238,964	1,601,856	1,685,935

a 359 tons containing 25 per cent. lead. Estimated product, 80.775 tons lead.
b 162 tons containing 45 per cent. lead. Estimated product, 65.610 tons lead.
c 49 tons containing 30 per cent. lead. Estimated product, 14.700 tons lead.

In addition to the bullion product from ores which were treated in the territory, there was also a considerable yield from ores and matte shipped to Chicago and to Omaha and reduced at these points. As nearly as ascertainable this additional product was as follows:

TABLE CXXXV.—UTAH—BULLION PRODUCED FROM UTAH ORES AND MATTE, TREATED ELSEWHERE THAN IN THE TERRITORY.

Ores and matte shipped to Chicago and Omaha.	Assay value per ton.			Total assay value.					Estimated yield per ton.			Estimated product, to be included in total production of Utah.					Remarks.
	Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.	Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.	
Tons.	Dolls.	Dolls.	Dolls.	Ozs.	Dolls.	Ozs.	Dolls.	Dolls.	Dolls.	Dolls.	Dolls.	Ozs.	Dolls.	Ozs.	Dolls.	Dolls.	
1,180	1 63	54 44	56 07	93	1,922	49,689	64,243	66,165	1 49	49 00	50 49	83.7	1,730	44,720	57,819	59,549	Containing 865,500 lbs. lead.
241	.....	64 64	64 64	.....	.....	12,050	15,579	15,579	.....	61 41	61 41	.....	.....	11,448	14,801	14,801	Containing 96,400 lbs. copper.
1,421	.....	.....	.....	93	1,922	61,739	79,822	81,744	.....	.....	.....	83.7	1,730	56,168	72,620	74,350	

From the preceding tables the following *résumé* is derived:

TABLE CXXXVI.—RÉSUMÉ.

Classification of product.	Bullion.				
	Gold.		Silver.		Total.
	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.
Bullion product traceable by districts from Utah ore raised during census year	8,910.9	184,205	2,260,408	2,922,481	3,106,686
Bullion product traceable by districts from Utah ore raised prior to census year	74.6	1,542	112.895	145,962	147,504
Net bullion product from Utah ores sold to and treated by Utah smelting works during census year	4,067.3	84,079	1,238,964	1,601,857	1,685,936
Estimated bullion product of ores and matte shipped to Chicago and Omaha during census year	83.7	1,730	56,168	72,620	74,350
Product of placer mines (of West Mountain district, Salt Lake county) during census year	967.5	20,000	.....	.....	20,000
Total	14,104.0	291,556	3,668,435	4,742,920	5,034,476

UTAH PLACER GOLD.—The small placer product of the territory ($20,000 in the census year) was from West Mountain district, in Salt Lake county.

MARKET VALUE OF UTAH BASE BULLION.—The gold and silver contents of the base bullion are sold at a price which allows for the refining charge on each metal, with, of course, the market discount on the silver. Thus the gold contents brought from $19 to $20 per ounce, and the silver an average of $1 10 per ounce during the census year.

The average price of refined lead at Salt Lake City during the same period was 4¾ cents per pound, and that of unrefined lead $47 50 per ton.

Market value of 2,586,370 pounds refined lead	$122,853
Market value of 28,756,831 pounds unrefined lead	682,975
Total	805,828

This represents roughly the value at the seaboard after deducting freight charges, commissions, etc. There were also $14,160 worth of copper sold, the product of Utah ores worked for the extraction of the precious metals. Adding the market value of the lead and copper, all of it an accessory product of the precious-metal industries, to the mint value of the precious metals, the total product of the Utah mines is raised to $5,854,462. This does not include the value of iron ore sold for flux, and some other small items.

WELLS, FARGO & CO.'S ESTIMATES OF THE UTAH BULLION PRODUCT.—By way of comparison, the following estimates of the Utah bullion product, furnished by Mr. J. E. Dooly, agent of Wells, Fargo & Co., at Salt Lake City, are appended. They are for the calendar years 1879 and 1880.

TABLE CXXXVII.—WELLS, FARGO & CO.'S STATEMENT OF THE MINERAL PRODUCT OF UTAH FOR 1879.

Base bullion.	Lead, refined.	Lead, unrefined.	Silver.	Gold.
	Pounds.	*Pounds.*	*Ounces.*	*Ounces.*
Chicago smelter	.....	1,789,138	90,006	270
Germania smelting and refining works	2,301,276	.....	344,836	2,202
Horn silver mine (Frisco smelter)	.....	4,134,892	248,936	632
Horn silver mine (Horn Silver Mining company's smelter)	.....	5,660,208	347,813	10
Marsac company	.....	30,299	54,552	.....
Mingo Furnace company	.....	3,925,104	245,339	931
Morgan smelter	.....	2,673,200	257,568	1,480
Old Telegraph company	.....	6,128,927	153,735	92
Pascoe smelter	.....	14,248	5,700	24
Waterman smelter	.....	235,004	7,285	.....
Total	2,301,276	24,541,050	1,755,360	5,641
Lead, silver, and gold, in ores, shipped	.....	1,900,309	42,229	52
Total (ores and base bullion)	2,301,276	26,441,359	1,797,589	5,693
DORÉ BARS AND DUST.				
Germania smelting and refining works			24,630	240
Ontario Silver Mining company			1,165,180	.....
Stewart Mining company			.....	5,000
Other mills			6,043	3,000
Bingham placers			.....	1,000
Leeds district (Silver Reef)			841,555	.....
Total			2,037,458	10,230

TABLE CXXXVII.—WELLS, FARGO & CO.'S STATEMENT OF THE MINERAL PRODUCT, ETC.—Cont'd.

RECAPITULATION.

2,301,276 pounds refined lead, at 4½ cents per pound	$103,557 42
26,441,359 pounds unrefined lead, at $45 per ton (average price for 1879)	594,930 57
3,835,047 ounces silver, at $1 10 per ounce (average price for 1879)	4,218,551 70
15,932 ounces gold, at $19 per ounce (average price for 1879)	302,708 00
Total	5,219,747 69

Mr. Dooly states that the foregoing exhibit "includes the product of ores received from Idaho, Montana, and Nevada, aggregating 126,000 pounds lead, 102,800 ounces silver, and 200 ounces gold".

TABLE CXXXVIII.—WELLS, FARGO & CO.'S STATEMENT OF THE MINERAL PRODUCT OF UTAH FOR 1880.

Base bullion.	Lead, refined.	Lead, unrefined.	Silver.	Gold.
	Pounds.	*Pounds.*	*Ounces.*	*Ounces.*
Chicago smelter		2,990,861	127,382	357
Germania smelting and refining works	2,892,498	1,722,805	102,909	685
Horn silver mine (Frisco smelter)		2,017,991	125,722	550
Horn silver mine (Horn Silver Mining company's smelter)		6,646,357	463,552	
Mingo Furnace company		6,404,382	272,832	675
Morgan smelter		2,733,782	157,374	519
Old Telegraph company		4,242,608	119,401	159
Other smelters		152,284	4,841	44
Total	2,892,498	26,971,080	1,434,013	2,989
Deduct base bullion purchased for Germania refining works		1,360,587	54,218	134
Net product base bullion	2,892,498	25,610,493	1,379,795	2,855
Lead, silver, and gold, in ores, shipped		831,600	24,024	23
Total refined lead, ores, and base bullion	2,892,498	26,442,093	1,403,819	2,878
DORÉ BARS.				
Germania refining works			36,422	116
Ontario Silver Mining company			1,439,542	
Tintic Milling and Mining company			41,923	58
Other mills			15,798	4,118
Bingham placers				850
Silver Reef mills			846,062	
Total doré bars			2,379,747	5,142

RECAPITULATION.

2,892,498 pounds refined lead, at 5 cents per pound	$144,624 90
26,442,093 pounds unrefined lead, at $50 per ton (average price for 1880)	661,052 32
3,783,566 ounces silver, at $1 10 (average price for 1880)	4,161,922 60
8,020 ounces gold, at $20	160,400 00
Total export value	5,127,999 82

In explanation, the agent observes:

The above includes the product of ores received from Idaho, Montana, and Nevada, aggregating 784,450 pounds lead and 120,383 ounces silver. Computing the gold and silver at the mint valuation and lead at its value at the seaboard, it would increase the value of the product to $6,450,953 70.

ARIZONA.

A marked impulse has been given to the mining industry of Arizona by the fine showing of the new Tombstone district, in Pima county. The bullion production of this district had only begun in the period covered by the census year. A few months later, with increased milling facilities, a considerably higher rate of production was maintained.

The accompanying tables contain a probable error of at least 20 per cent., owing to the fact that no schedule data were available for estimating the production from the following sources: Various districts in Apache county; in Maricopa county, the Vulture mine (a large producer) and Myers district; in Mohave county, Aubrey, Hope, and San Francisco districts; in Pima county, Aztec, De Frees, Huachucha, Patagonia, Santa Catarina, and Tyndall districts, also several important mines in Tombstone district; in Pinal county, Mineral, Pinal, Randolph, and Summit districts, also the Silver King mine in Pioneer district and the Silver Era mine in Globe district; in Yavapai county, Agua Fria, Greenwood, Hassayampa, Lynx Creek, Martinez, Pine Grove, and Turkey Creek districts; in Yuma county, Bill Williams' Fork, Eureka, Harcuvar, La Paz, Montezuma, and Weaver districts. The estimates given for the production from the sources mentioned as not included in the schedule data furnished by the experts accordingly have a wide margin of uncertainty in comparison with the statements of the yield of localities from which fuller information was received.

TABLE CXXXIX.—ARIZONA—PRODUCTION OF DEEP

	County and district.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.		
			Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
		Tons.	Dolls.	Dolls.	Dolls.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Dolls.	Dolls.	Dolls.
	MARICOPA.													
1	Globe	1,989	1 51	114 43	115 94	145.1	2,999	176,039	227,601	230,600	264.00	.....	376 44	376 44
	Total	1,989	1 51	114 43	115 94	145.1	2,999	176,039	227,601	230,600	264.00	.....	376 44	376 44
	MOHAVE.													
1	Cedar Valley	80	.....	112 30	112 30	.....	.....	6,949	8,985	8,985	80.00	.....	92 88	92 88
2	Hualapai	2,188½	12 91	80 15	93 06	1,367.1	28,260	135,604	175,400	203,660	463.00	19 98	137 38	157 36
3	Maynard	151	.....	144 00	144 00	.....	.....	16,848	21,744	21,744	151.00	.....	125 45	125 45
4	Owen's	160	.....	25 00	25 00	.....	.....	3,094	4,000	4,000	160.00	.....	*20 00	*20 00
5	Scattered	39	.....	271 97	271 97	.....	.....	8,204	10,607	10,607	39.00	.....	232 56	232 56
	Total	2,618½	10 79	84 30	95 09	1,367.1	28,260	170,729	220,736	248,996	893.00	10 36	114 49	124 85
	PIMA.													
1	Arivaca	100	.....	*200 00	*200 00	.....	.....	*15,469	*20,000	*20,000	.....	.....	.....	.....
2	Dos Cabezas	370	31 32	1 32	32 64	560.7	11,591	379	490	12,081	.....	.....	.....	.....
3	Harshaw	4,650	.....	64 19	64 19	.....	.....	230,877	298,501	298,501	.....	.....	.....	.....
4	Hartford	50	.....	20 00	20 00	.....	.....	773	999	999	.....	.....	.....	.....
5	Oro Blanco	1,325	10 45	55 62	66 07	670.0	13,850	57,003	73,699	87,549	68.50	.....	*53 60	*53 60
6	Pima	310	.....	30 00	30 00	.....	.....	7,193	9,300	9,300	.....	.....	.....	.....
7	Swisshelm	410	.....	35 61	35 61	.....	.....	11,293	14,601	14,601	.....	.....	.....	.....
8	Tombstone	18,123	12 21	84 36	96 57	10,710.7	221,410	1,182,441	1,528,778	1,750,188	12,380.00	7 81	64 82	72 63
	Total	25,338	9 74	76 82	86 56	11,941.4	246,851	1,505,428	1,946,368	2,193,219	12,448.50	9 74	76 82	86 56
	PINAL.													
1	Globe	706	29 91	5 05	34 96	1,021.6	21,119	2,753	3,559	24,678	52.25	48 34	15 87	64 21
2	Pioneer	245	18 37	104 65	123 02	217.7	4,500	19,831	25,640	30,140	67.50	.....	59 20	59 20
3	Turquoise	250	.....	35 00	35 00	.....	.....	6,768	8,750	8,750	.....	.....	.....	.....
	Total	1,201	21 33	31 60	52 93	1,239.3	25,619	29,352	37,949	63,568	119.75	21 00	40 33	61 42
	YAVAPAI.													
1	Big Bug	1,500	.....	123 33	123 33	.....	.....	143,089	185,000	185,000	300.00	.....	*237 50	*237 50
2	Cave Creek	200	*25 00	.....	*25 00	*241.9	*5,001	.....	.....	*5,001	200.00	*20 00	.....	*20 00
3	Cherry Creek	500	*6 00	.....	*6 00	*145.1	*2,999	.....	.....	*2,999	200.00	*3 00	.....	*3 00
4	Humbug	1,850	.....	*200 00	*200 00	.....	.....	286,179	370,001	370,001	977.00	.....	243 45	243 45
5	Peck	325	.....	264 46	264 46	.....	.....	66,478	85,949	85,949	321.00	.....	202 36	202 36
6	Tiger	1,500	*2 00	*117 00	*119 00	*145.1	*2,999	*135,741	*175,500	*178,499	1,000.00	1 60	92 59	94 19
7	Walker	*25	*25 00	.....	*25 00	*30.2	*625	.....	.....	*625	*25.00	*20 00	.....	*20 00
8	Walnut Grove	300	*25 00	.....	*25 00	*362.8	*7,500	.....	.....	*7,500	.....	.....	.....	.....
9	Weaver No. 2	400	*25 00	.....	*25 00	*483.8	*10,001	.....	.....	*10,001	*200.00	*20 00	.....	*20 00
	Total	6,600	4 41	123 70	128 11	*1,408.9	*29,125	631,487	816,450	845,575	3,223.00	3 32	144 79	148 11
	YUMA.													
1	Castle Dome	1,100	.....	34 08	34 08	.....	.....	28,995	37,488	37,488	.....	.....	.....	.....
2	Ellsworth, Plumas, or Centennial	250	27 50	.....	27 50	332.6	6,875	.....	.....	6,875	204.00	5 00	.....	5 00
3	Myers	500	.....	50 00	50 00	.....	.....	19,337	25,001	25,001	.....	.....	.....	.....
4	Silver	80	.....	*75 00	*75 00	.....	.....	4,641	*6,000	*6,000	.....	.....	.....	.....
	Total	1,930	3 56	35 49	39 05	332.6	6,875	52,973	68,489	75,364	204.00	5 00	.....	5 00

*Estimated.

TABLE CXL.—ARIZONA—RECAPITULATION BY COUNTIES OF

	County.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.		
			Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
		Tons.	Dolls.	Dolls.	Dolls.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Dolls.	Dolls.	Dolls.
1	Maricopa	1,989.00	1 51	114 43	115 94	145.1	2,999	176,039	227,601	230,600	264.00	.....	376 44	376 44
2	Mohave	2,618.50	10 79	84 30	95 09	1,367.1	28,260	170,729	220,736	248,996	893.00	10 36	114 49	124 85
3	Pima	25,338.00	9 74	76 82	86 56	11,941.4	246,851	1,505,428	1,946,368	2,193,219	12,448.50	9 74	76 82	86 56
4	Pinal	1,201.00	21 33	31 60	52 93	1,239.3	25,619	29,352	37,949	63,568	119.75	21 00	40 33	61 42
5	Yavapai	6,600.00	4 41	123 70	128 11	*1,408.9	*29,125	631,487	816,450	845,575	3,223.00	3 32	144 79	148 11
6	Yuma	1,930.00	3 56	35 49	39 05	332.6	6,875	52,973	68,489	75,364	204.00	5 00	.....	5 00
	Total	39,676.50	8 56	83 61	92 17	16,434.4	339,729	2,566,008	3,317,593	3,657,322	17,152.25	7 01	86 24	93 25
	*Additional production	*8,576.00	*9 35	*114 99	*124 34	*3,877.9	*80,163	*762,745	*986,153	*1,066,316	*8,576.00	*7 01	*86 24	*93 25
	* Total production	*48,252.50	*8 70	*89 19	*97 89	*20,312.3	*419,892	*3,328,753	*4,303,746	*4,723,638	*25,728.25	*7 01	*86 24	*93 25

* Estimated.

MINES FOR THE YEAR ENDING MAY 31, 1880.

Bullion produced from ore raised and treated during census year.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.					Bullion produced during census year from ore previously raised.				
Gold.		Silver.		Total.		Gold.		Silver.		Total.	Gold.		Silver.		Total.
Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Ozs.	Dolls.	Ozs.	Dollars.	Dolls.	
.....	.....	76,866	99,380	99,380	1,725.00	145.1	2,999	82,276	106,375	109,374	.....	.....	.....	.....	.....	1
.....	.....	76,866	99,380	99,380	1,725.00	145.1	2,999	82,276	106,375	109,374	.....	.....	.....	.....	.....	
.....	.....	5,747	7,430	7,430	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
447.5	9,251	49,195	63,604	72,855	1,725.50	709.2	14,660	85,737	110,840	125,509	.....	.....	1,183	1,530	1,530	2
.....	.....	14,652	18,944	18,944	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
.....	.....	2,475	*3,200	*3,200	.....	.....	.....	.....	.....	.....	.....	.....	9,746	12,600	a12,600	4
.....	.....	7,015	9,070	9,070	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5
447.5	9,251	79,084	102,248	111,499	1,725.50	709.2	14,660	85,737	110,840	125,509	.....	.....	10,929	14,130	14,130	
.....	.....	.....	.....	.....	100.00	.....	.....	*15,469	*20,000	*20,000	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	370.00	560.7	11,591	379	490	12,081	.....	.....	.....	.....	.....	2
.....	.....	.....	.....	.....	4,650.00	.....	.....	230,877	298,500	298,500	.....	.....	.....	.....	.....	3
.....	.....	.....	.....	.....	50.00	.....	.....	773	1,000	1,000	.....	.....	.....	.....	(b)	4
.....	.....	*2,840	*3,672	*3,672	1,256.50	670.0	13,850	53,453	69,109	82,959	.....	.....	.....	.....	.....	5
.....	.....	.....	.....	.....	310.00	.....	.....	7,193	9,300	9,300	.....	.....	.....	.....	.....	6
.....	.....	.....	.....	.....	410.00	.....	.....	11,293	14,601	14,601	.....	.....	.....	.....	.....	7
4,680.2	96,748	620,659	802,450	899,198	5,743.00	4,617.8	95,458	443,237	573,061	668,519	.....	.....	.....	.....	.....	8
4,680.2	96,748	623,499	806,122	902,870	12,889.50	5,848.5	120,899	702,674	986,061	1,106,960	.....	.....	.....	.....	.....	
122.2	2,526	641	829	3,355	653.75	945.8	19,552	2,366	3,059	22,611	.....	.....	.....	.....	.....	1
.....	.....	3,094	4,000	4,000	177.50	217.7	4,500	6,153	7,955	12,455	.....	.....	.....	.....	.....	2
.....	.....	.....	.....	.....	250.00	.....	.....	6,768	8,750	8,750	.....	.....	.....	.....	.....	3
122.2	2,526	3,735	4,829	7,355	1,081.25	1,163.5	24,052	15,287	19,764	43,816	.....	.....	.....	.....	.....	
.....	.....	*55,109	*71,250	*71,250	1,200.00	.....	.....	85,080	110,000	110,000	.....	.....	.....	.....	.....	1
193.5	*4,000	.....	.....	*4,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
*29.0	*600	.....	.....	*600	300.00	*87.1	*1,800	.....	.....	*1,800	.....	.....	.....	.....	.....	3
.....	.....	183,964	237,847	237,847	873.00	.....	.....	70,279	102,500	102,500	.....	.....	.....	.....	.....	4
.....	.....	50,243	64,959	64,959	*4.00	.....	.....	*919	*1,188	*1,188	.....	.....	.....	.....	.....	5
77.4	1,600	71,617	92,594	94,194	500.00	*48.4	*1,000	*45,247	*58,500	*59,500	77.4	1,600	71,617	92,594	94,194	6
24.2	*500	.....	.....	*500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7
.....	.....	.....	.....	.....	300.00	*362.8	*7,500	.....	.....	*7,500	.....	.....	.....	.....	(c)	8
193.5	*4,000	.....	.....	*4,000	200.00	*241.9	*5,001	.....	.....	*5,001	.....	.....	.....	.....	.....	9
517.6	10,700	360,933	466,650	477,350	3,377.00	*740.2	*15,301	210,525	272,188	287,489	77.4	1,600	71,617	92,594	94,194	
.....	.....	.....	.....	.....	1,100.00	.....	.....	28,905	37,488	37,488	.....	.....	.....	.....	.....	1
49.3	1,019	.....	.....	1,019	46.00	61.2	1,265	.....	.....	1,265	.....	.....	.....	.....	.....	2
.....	.....	.....	.....	.....	500.00	.....	.....	19,337	25,001	25,001	.....	.....	.....	.....	.....	3
.....	.....	.....	.....	.....	80.00	.....	.....	4,641	*6,000	*6,000	.....	.....	.....	.....	.....	4
49.3	1,019	.....	.....	1,019	1,726.00	61.2	1,265	52,973	68,489	69,754	.....	.....	.....	.....	.....	

* Estimated. *a* From 2,340 tons tailings, yielding $5.38 per ton. *b* Copper 10 per cent. *c* Lead 65 per cent.; production quoted is for year ending December 31, 1880.

PRODUCTION OF DEEP MINES FOR THE YEAR ENDING MAY 31, 1880.

Bullion produced from ore raised and treated during census year.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.					Bullion produced during census year from ore previously raised.				
Gold.		Silver.		Total.		Gold.		Silver.		Total.	Gold.		Silver.		Total.
Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Ozs.	Dolls.	Ozs.	Dolls.	Dolls.	
.....	.....	76,866	99,380	99,380	1,725.00	145.1	2,999	82,276	106,375	109,374	.....	.....	.....	.....	.....	1
447.5	9,251	79,084	102,248	111,499	1,725.50	709.2	14,660	85,737	110,840	125,509	.....	.....	10,929	14,130	14,130	2
4,680.2	96,748	623,499	806,122	902,870	12,889.50	5,848.5	120,899	702,674	986,061	1,106,960	.....	.....	.....	.....	.....	3
122.2	2,526	3,735	4,829	7,355	1,081.25	1,163.5	24,052	15,287	19,764	43,816	.....	.....	.....	.....	.....	4
517.6	10,700	360,933	466,650	477,350	3,377.00	*740.2	*15,301	210,525	272,188	287,489	77.4	1,600	71,617	92,594	94,194	5
49.3	1,019	.....	.....	1,019	1,726.00	61.2	1,265	52,973	68,489	69,754	.....	.....	.....	.....	.....	6
5,816.8	120,244	1,144,117	1,479,229	1,599,473	22,524.25	8,667.7	179,176	1,209,472	1,563,726	1,742,902	77.4	1,600	82,546	106,724	108,324	
*2,908.4	*60,122	*572,059	*739,615	*799,737	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
*8,725.2	*180,366	*1,716,176	*2,218,844	*2,399,210	22,524.25	8,667.7	179,176	1,209,472	1,563,726	1,742,902	77.4	1,600	82,546	106,724	108,324	

TABLE CXLI.—ARIZONA—PRODUCTION OF PLACER MINES FOR THE YEAR ENDING MAY 31, 1880.

County and district.	Gold.	
	Ounces.	Dollars.
YAVAPAI COUNTY.		
Castle Creek	72.5	1,499
Hassayampa	193.5	4,000
Walker	241.9	5,000
Walnut Grove	48.4	1,001
Weaver No. 2	241.9	5,000
Total, as derived from schedule data	798.2	16,500
Additional production, estimated	*653.0	*13,499
Total production, estimated	*1,451.2	*29,999

*Estimated.

DISTRIBUTION.—In addition to the ordinary difficulties of the investigation, absolute refusals to furnish information were met with on the part of some of the important mining companies of Arizona. The following estimate of the actual distribution is probably a tolerable approximation:

Maricopa	$350,000
Mohave	200,000
Pima	1,000,000
Pinal	350,000
Yavapai	575,000
Yuma	2,000
Placer gold	30,000
Unknown sources	30,633
Total	2,537,633

IDAHO.

The tabulation of the output of this territory is based upon reports of the examining expert on 369 deep mines, 14 placer mines, 18 amalgamating mills, 2 arrastras, and 2 smelting works, besides several general reports on whole districts.

From 1876 up to the close of the census year, the product of this territory has been mainly dependent upon the older mining districts, of which the placer mines of Boisé basin have contributed a large proportion. The panic in the stock market of San Francisco in 1876 led to a suspension of operations in the principal Owyhee mines, which for some years previous to that period had yielded large returns. This crash was due quite as much to mismanagement of the mines themselves as to causes inherent in the speculative market; but whatever the reason, the result was the closing down of many mines which probably would have been still largely productive if properly worked. As the case now stands, the Owyhee district, which formerly yielded by far the greater part of the total output of the territory, at present furnishes only about one-fifth of the aggregate. It is to be hoped that at no distant time in the future this district may again appear as a large producing center.

Had the census statistics been collected only a few months later, the new and promising Wood river country would have added largely to the total product. Operations in this district were only seriously begun toward the close of May, 1880; hence the large product from ores shipped to Salt Lake during the fall of the same year does not enter into the tabulation for the census year.

In addition to the developments in the Wood river country, a number of other new localities appear as future important productive sources, prominent among which is the Sawtooth district, which from the absence of local milling facilities was at a standstill pending the erection of reduction works. Another year will witness a considerable bullion production from the mines of this district. The same remark holds good with regard to Smiley's cañon, from which a small amount of ore was shipped at great expense to distant points for reduction. The returns from these shipments were such as to give great hope for a large increase when it becomes possible to treat the ores at greater advantage in mills placed near the mines.

In the Yankee Fork region a decided impulse—the effect of which was not shown until the opening of the season of 1881—was given by the erection of the fine and well appointed mill of the Custer company. Previous to the building of this mill the ores of the district had either to be worked in arrastras, with a large percentage of loss, or be freighted at a heavy charge to Salt Lake, or elsewhere, for treatment. In spite of these disadvantages two mines were shipping considerable amounts of $900 ore, while a third was developing an immense body of ore which was expected to yield $300 per ton.

The smelting works recently constructed at Bay Horse and Kinnikinnick will also add largely to the total product.

The period covered by the census year, while one of great promise for the future of the territory, nevertheless showed a comparatively small yield. The probabilities are that within two years the output of Idaho will at least have doubled.

The deposits of Idaho bullion (so far as it is possible to segregate them—a very large portion having passed through private refineries and thus losing their identity) up to the close of the fiscal year ending June 30, 1880, are stated by the director of the mint to have been $24,137,417 gold, $727,296 silver, and $24,864,713 total. This amount is considerably within the actual output.

Of the total gold product of Idaho, 59.45 per cent. is from the placers, and 40.55 per cent. from the deep mines. Idaho furnishes 7.33 per cent. of the placer output of the United States, 2.81 per cent. of the deep-mine gold, and 4.43 per cent. of the total gold; 1.13 per cent. of the silver, and 2.61 per cent. of the entire product of the precious metals in the whole country. As a gold-producer the territory ranks sixth, and in silver, seventh. The average yield per square mile is $17 45 gold, $5 48 silver, and $22 93 total. In this respect Idaho stands fifth in point of gold, seventh in silver, and sixth in developed richness in gold and silver. The average yield per capita is $45 37 gold, $14 25 silver, and $59 62 in both precious metals, placing the rank as regards product in reference to population third as to gold, sixth as to silver, and fifth altogether. The comparison with regard to population is probably the most reliable test of the relative prosperity of a mining region.

TABLE CXLII.—IDAHO—PRODUCTION OF DEEP MINES

	County and district.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.		
			Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
		Tons.	Dolls.	Dolls.	Dolls.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Dolls.	Dolls.	Dolls.
	ALTURAS.													
1	Bear Creek, or Rocky Bar	420.00	49 53	.....	49 53	1,028.0	21,250	.....	.....	21,250	150.00	34 33	.....	34 33
2	Bonaparte	190.00	32 52	1 62	34 14	298.9	6,179	237	306	6,485	.....	.....	.....	.....
3	Buffalo, or Atlanta	2,288.75	37 36	60 30	97 66	4,136.4	85,507	106,761	138,031	223,538	558.00	61 92	106 51	168 43
4	Queen's River	300.00	56 83	3 33	60 16	824.8	17,050	773	1,000	18,050	.....	.....	.....	.....
5	Red Warrior	295.00	50 17	.....	50 17	715.9	14,799	.....	.....	14,799	200.00	42 69	.....	42 69
6	Sawtooth	*175.00	*10 00	*90 00	*100 00	84.7	*1,751	12,182	*15,750	*17,501	.....	.....	.....	.....
7	Smiley's Cañon	*200.00	*10 00	*65 00	*75 00	96.7	*1,999	10,055	*13,000	*14,999	.....	.....	.....	.....
8	(a) Wood River (b)	*200.00	.....	*100 00	*100 00	.....	.....	15,469	*20,000	*20,000	.....	.....	.....	.....
	Total	4,077.75	36 43	46 12	82 55	7,185.4	148,535	145,477	188,087	336,622	908.00	53 13	65 45	118 58
	BOISÉ.													
1	Banner	1,320.00	24	81 47	81 81	21.8	451	85,185	107,550	108,001	1,128.00	.....	74 63	74 63
2	Cañon Creek	355.00	91 19	.....	91 19	1,566.1	32,374	.....	.....	32,374	225.00	85 28	.....	85 28
3	Gambrinus	350.00	9 06	.....	9 06	372.5	7,700	.....	.....	7,700	600.00	5 50	.....	5 50
4	Granite, or Quartzburg	13,038.00	16 31	.....	16 31	10,286.6	212,643	.....	.....	212,643	12,800.00	13 28	.....	13 28
5	Mammoth, or Summit Flat	600.00	10 46	.....	10 46	303.6	6,276	.....	.....	6,276	550.00	9 50	.....	9 50
6	Shaw's Mountain	442.00	43 81	1 46	50 27	1,043.7	21,575	499	*645	22,220	342.00	36 59	88	37 42
	Total	16,605.00	16 92	6 51	23 43	13,594.3	281,019	85,684	108,195	389,214	15,645.00	13 44	5 39	18 83
	IDAHO.													
1	Copeland's, Deadwood, Florence, Mayfield's, Warren's Camp, Washington, scattered	*500.00	*25 00	.....	*25 00	604.7	*12,500	.....	.....	*12,500	*500.00	*20 00	.....	*20 00
	Total	*500.00	*25 00	.....	*25 00	604.7	*12,500	.....	.....	*12,500	*500.00	*20 00	.....	*20 00
	LEMHI.													
1	Bay Horse and Kinniekinnick, Clear Creek, Deep Creek, Dahlonega or Gibbonsville, Estes Mountain, Scarlet Mountain, Yankee Fork, Yellow Jacket, scattered	*5,000.00	*60 00	*60 00	*120 00	14,512.5	*300,000	232,036	*299,999	*599,999	*2,500.00	*50 00	*50 00	*100 00
	Total	*5,000.00	*60 00	*60 00	*120 00	14,512.5	*300,000	232,036	*299,999	*599,999	*2,500.00	*50 00	*50 00	*100 00
	NEZ PERCÉS.													
1	Moscow, scattered	*300.00	*20 00	.....	*20 00	290.3	*6,001	.....	.....	*6,001	*300.00	*15 00	.....	*15 00
	Total	*300.00	*20 00	.....	*20 00	290.3	*6,001	.....	.....	*6,001	*300.00	*15 00	.....	*15 00
	ONEIDA.													
1	Caribou, scattered	*500.00	*25 00	.....	*25 00	604.7	*12,500	.....	.....	*12,500	*500.00	*20 00	.....	*20 00
	Total	*500.00	*25 00	.....	*25 00	604.7	*12,500	.....	.....	*12,500	*500.00	*20 00	.....	*20 00
	OWYHEE.													
1	Carson, or Owyhee	7,247.75	33 00	33 44	66 44	11,605.8	239,913	188,538	243,761	483,674	6,625.75	25 39	25 77	51 10
2	Wagontown	995.00	23 88	97 27	61 15	1,270.5	26,264	26,752	34,588	60,852	451.00	20 90	8 44	29 34
3	Scattered	*100.00	*37 50	*37 50	*75 00	181.4	*3,750	2,900	*3,749	7,499	*100.00	*25 00	*25 00	*50 00
	Total	8,342.75	32 35	33 81	66 16	13,057.7	269,927	218,190	282,098	552,025	7,176.75	25 00	24 68	49 77
	WASHINGTON.													
1	Heath, scattered	*500.00	*15 00	.....	*15 00	362.8	*7,500	.....	.....	*7,500	*500.00	*10 00	.....	*10 00
	Total	*500.00	*15 00	.....	*15 00	362.8	*7,500	.....	.....	*7,500	*500.00	*10 00	.....	*10 00

a Lead, 60 per cent., or 120 tons. * Estimated.

b Big Smoky, Black Barb or Kelly's, Bradford or Jacob's City, Croy's Gulch, East Fork, Elk Mountain or Bullion, Galena, Greenhorn, Little Smoky, Lower Wood River, Mineral Hill, Star Mountain, Upper Wood River, Warm Springs.

TABLE CXLIII.—IDAHO—RECAPITULATION BY COUNTIES OF

	County.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.		
			Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
		Tons.	Dolls.	Dolls.	Dolls.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Dolls.	Dolls.	Dolls.
1	Alturas	4,077.75	36 43	46 12	82 55	7,185.4	148,535	145,477	188,087	336,622	908.00	53 13	65 45	118 58
2	Boisé	16,605.00	16 92	6 51	23 43	13,594.3	281,019	85,684	108,195	389,214	15,645.00	13 44	5 39	18 83
3	Idaho	*500.00	*25 00	.....	*25 00	604.7	*12,500	.....	.....	*12,500	*500.00	*20 00	.....	*20 00
4	Lemhi	*5,000.00	*60 00	*60 00	*120 00	14,512.5	*300,000	232,036	*299,999	*599,999	*2,500.00	*50 00	*50 00	*100 00
5	Nez Percés	*300.00	*20 00	.....	*20 00	290.3	*6,001	.....	.....	*6,001	*300.00	*15 00	.....	*15 00
6	Oneida	*500.00	*25 00	.....	*25 00	604.7	*12,500	.....	.....	*12,500	*500.00	*20 00	.....	*20 00
7	Owyhee (a)	8,342.75	32 35	33 81	66 16	13,057.7	269,927	218,190	282,098	552,025	7,176.75	25 09	24 68	49 77
8	Washington	500.00	15 00	.....	15 00	362.8	7,500	.....	.....	7,500	500.00	10 00	.....	10 00
	Total	35,825.50	28 97	24 52	53 49	50,212.4	1,037,982	679,387	878,379	1,916,361	28,029.75	21 16	15 91	37 07

* Estimated. a Including 300 tons tailings reworked.

FOR THE YEAR ENDING MAY 31, 1880.

Bullion produced from ore raised and treated during census year.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.					Bullion produced during census year from ore previously raised.					
Gold.		Silver.		Total.		Gold.		Silver.		Total.	Gold.		Silver.		Total.	
Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Ozs.	Dolls.	Ozs.	Dolls.	Dolls.	
240.1	5,149	.....	.....	5,149	270.00	705.9	14,592	.....	.....	14,592	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	190.00	298.9	6,170	237	306	6,485	.....	.....	.....	.....	.....	2
1,671.5	34,553	45,971	59,436	93,989	1,730.75	2,107.8	44,812	56,936	73,613	118,425	169.3	3,500	2,707	3,500	7,000	3
.....	.....	.....	.....	.....	300.00	824.7	17,048	773	1,000	18,048	.....	.....	.....	.....	.....	4
413.1	8,540	.....	.....	8,540	95.00	218.0	4,507	.....	.....	4,507	.....	.....	.....	.....	.....	5
.....	.....	.....	.....	.....	*175.00	84.7	*1,751	12,183	*15,751	*17,502	.....	.....	.....	.....	.....	6
.....	.....	.....	.....	.....	*200.00	96.7	*1,999	10,055	*13,000	*14,999	.....	.....	.....	.....	.....	7
.....	.....	.....	.....	.....	*200.00	.....	.....	15,469	*20,000	*20,000	.....	.....	.....	.....	.....	8
2,333.7	48,242	45,971	59,436	107,678	3,169.75	4,396.7	90,888	95,653	123,070	214,558	169.3	3,500	2,707	3,500	7,000	
.....	.....	65,111	84,182	84,182	192.00	21.8	451	13,388	17,309	17,760	.....	.....	.....	.....	.....	1
928.3	19,189	.....	.....	19,189	130.00	507.9	10,499	.....	.....	10,499	166.2	3,436	.....	.....	3,436	2
159.6	3,299	.....	.....	3,299	*250.00	169.3	*3,500	.....	.....	*3,500	.....	.....	.....	.....	.....	3
8,223.7	169,999	.....	.....	169,999	238.00	998.7	20,645	.....	.....	20,645	.....	.....	.....	.....	.....	4
252.8	5,226	.....	.....	5,226	50.00	24.2	500	.....	.....	500	.....	.....	.....	.....	.....	5
605.5	12,517	219	283	12,800	*100.00	145.1	*2,999	.....	.....	*2,999	.....	.....	.....	.....	.....	6
10,169.9	210,230	65,330	84,465	294,695	960.00	1,867.0	38,594	13,388	17,309	55,903	166.2	3,436	.....	.....	3,436	
483.7	*9,999	.....	.....	*9,999	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
483.7	*9,999	.....	.....	*9,999	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
6,046.9	*125,001	96,683	*125,001	*250,002	*2,500.00	7,256.2	*149,999	116,018	*150,000	*299,999	.....	.....	.....	.....	.....	1
6,046.9	*125,001	96,683	*125,001	*250,002	*2,500.00	7,256.2	*149,999	116,018	*150,000	*299,999	.....	.....	.....	.....	.....	
217.7	*4,500	.....	.....	*4,500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
217.7	*4,500	.....	.....	*4,500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
483.7	*9,999	.....	.....	*9,999	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
483.7	*9,999	.....	.....	*9,999	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
8,135.4	168,174	132,105	170,799	338,973	622.00	2,230.8	46,115	35,059	45,328	91,443	.....	.....	.....	.....	.....	1
456.1	9,428	2,047	3,810	13,238	544.00	660.9	13,602	23,504	30,388	44,050	.....	.....	.....	.....	.....	2
120.9	*2,499	1,933	*2,499	*4,998	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
8,712.4	180,101	136,985	177,108	357,209	1,166.00	2,891.7	59,777	58,563	75,716	135,493	.....	.....	.....	.....	.....	
241.9	*5,001	.....	.....	*5,001	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
241.9	*5,001	.....	.....	*5,001	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	

PRODUCTION OF DEEP MINES FOR THE YEAR ENDING MAY 31, 1880.

Bullion produced from ore raised and treated during census year.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.					Bullion produced during census year from ore previously raised.					
Gold.		Silver.		Total.		Gold.		Silver.		Total.	Gold.		Silver.		Total.	
Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Ozs.	Dolls.	Ozs.	Dolls.	Dolls.	
2,333.7	48,242	45,971	59,436	107,678	3,169 75	4,396.7	90,888	95,653	123,070	214,558	169.3	3,500	2,707	3,500	7,000	1
10,169.9	210,230	65,330	84,465	294,695	960 00	1,867.0	38,594	13,388	17,309	55,903	166.2	3,436	.....	.....	3,436	2
483.7	*9,999	.....	.....	*9,999	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
6,046.9	*125,001	96,683	*125,001	*250,002	*2,500 00	7,256.2	*149,999	116,018	*150,000	*299,999	.....	.....	.....	.....	.....	4
217.7	*4,500	.....	.....	*4,500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5
483.7	*9,999	.....	.....	9,999	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6
8,712.4	180,101	136,985	177,108	357,209	1,166 00	2,891.7	59,777	58,563	75,716	135,493	.....	.....	.....	.....	.....	7
241.9	*5,001	.....	.....	*5,001	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8
28,689.9	593,073	344,969	446,010	1,039,083	7,795 75	16,411.6	339,258	283,622	366,695	705,953	335.5	6,936	2,707	3,500	10,436	

TABLE CXLIV.—IDAHO—PRODUCTION OF HYDRAULIC, PLACER, DRIFT, AND RIVER MINES FOR THE YEAR ENDING MAY 31, 1880.

County and district.	Gold. Totals, by counties.	
	Ounces.	Dollars.
ADA.		
Various small placers	241.9	5,001
ALTURAS.		
Bane's Diggings, Bear Creek, California Bar, Elk Creek, Middle Boisé, Parsons' Bar, Red Warrior, Stanley Basin, Tuscarora Bar, scattered	1,693.1	34,999
BOISÉ.		
Bear Run, Boston, Bummer Hill, Centerville, Cold Spring Gulch, Elk Creek, Granite, Grayback Bar, Grimes' Creek, Lapraway Creek, Last Chance Bar, Moore's Creek, Noble's Gulch, Pioneer, Placerville, Squaw Creek, Willow Creek, scattered	30,120.4	622,644
CASSIA.		
Bonanza Bar, Rock Creek, Salmon Falls, scattered	967.5	20,000
IDAHO.		
Butts' Bar, Copeland Diggings, Elk City, Florence, Gold Fork, Little Salmon River, Mallett's Placers, Meadow Creek, Miller Creek, Salmon River, Sand Creek, South Fork, Warren's, scattered	2,902.5	60,000
LEMHI.		
Anderson Creek, Curly Creek, Dahlonega or Gibbonsville, Jordan Creek, Salmon City, Yankee Fork, scattered	967.5	20,000
NEZ PERCES.		
Various small placers	483.8	10,001
ONEIDA.		
Eagle Rock, Iowa Bar, Snake River, Tin Cup, scattered	1,451.2	29,999
OWYHEE.		
Blue Gulch, Bruneau Valley, Jordan Creek, Meadow Creek, Ruby Gulch, scattered	2,515.5	52,000
SHOSHONE.		
Number One, scattered	483.8	10,001
WASHINGTON.		
Various small placers	725.6	14,999
Total	42,552.8	879,644

OREGON.

Oregon is one of the oldest of the western mining states, the discovery of gold within its limits having followed closely upon that in California. Its output has never been very large, in comparison with the yield of its neighbor state, but although the mines have become secondary to its agricultural resources in point of importance, they still furnish occupation and profit to many of its inhabitants. The quartz veins of Baker county, in the eastern portion of the state, adjoining Idaho territory, continue to yield the larger portion of the total deep-mine product of this state. The prevailing type of the Oregon ores is a free gold quartz, though rebellious gold ores, requiring special treatment, are found in some localities, and a small amount of silver is produced in Grant county.

The latter county takes the lead in surface mining, while Baker, Jackson, and Josephine counties are also productive of a considerable amount of placer gold.

Oregon now ranks seventh on the roll of the mining states in production of gold, eleventh in output of silver, and ninth in its yield of both metals. Its quota toward the total production of the United States is 7.71 per cent. of the placer gold, 0.80 per cent. of the deep-mine gold, 3.29 per cent. of the total gold, and only 0.07 per cent. of the total silver. The percentage of the total combined gold and silver product is 1.51 per cent. The average yield per square mile is $11 43 gold, $0 29 silver, and $11 72 total. The product per capita is $6 28 gold, $0 16 silver, and $6 44 total, giving Oregon a rank of seventh in gold, tenth in silver, and ninth in total bullion output, in point of production as relative to population. The small proportion per capita shows how completely mining has been overshadowed by other industries in this state.

TABLE CXLV.—OREGON—PRODUCTION OF DEEP MINES FOR THE YEAR ENDING MAY 31, 1880.

County and district.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.		
		Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
	Tons.	Dollars.	Dollars.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Dolls.	Dolls.	Dolls.
BAKER.													
Burnt River	1,089	28 45	5 51	33 96	1,498.6	30,979	4,641	6,000	36,979	1,089	7 70	1 38	9 08
Chicken Creek	125	*45 94	.....	*45 94	*277.8	*5,743	.....	.....	*5,743	125	34 46	.....	34 46
Conner Creek	10,800	*5 00	.....	*5 00	*2,012.2	*53,999	.....	.....	*53,999	10,800	*4 70	.....	*4 70
Pocahontas	100	*258 75	.....	*258 75	*1,251.7	*25,875	.....	.....	*25,875	100	207 00	.....	207 00
Rye Valley	93	10 00	112 00	122 00	45.0	930	8,056	10,416	11,346	93	1 58	30 18	30 76
Silver Creek	130	30 00	30 00	60 00	188.7	3,901	3,016	3,899	7,800	.....	.....	.....	.....
Virtue	400	*46 66	.....	*46 66	*902.9	*18,664	.....	.....	*18,664	400	35 00	.....	35 00
Total	12,737	11 00	1 59	12 59	6,776.9	140,091	15,713	20,315	160,406	12,607	7 80	34	8 14
GRANT.													
Granite	1,200	76 87	45 88	122 75	4,462.1	92,240	42,570	55,051	147,291	1,015	67 21	13 43	80 64
Total	1,200	76 87	45 88	122 75	4,462.1	92,240	42,570	55,051	147,291	1,015	67 21	13 43	80 64
JOSEPHINE.													
Yank	150	*34 83	.....	*34 83	252.7	*5,224	.....	.....	*5,224	150	31 66	.....	31 66
Total	150	*34 83	.....	*34 83	*252.7	*5,224	.....	.....	*5,224	150	31 66	.....	31 66

County and district.	Bullion produced from ore raised and treated during census year.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.					Bullion produced during census year from ore previously raised.				
	Gold.		Silver.		Total.		Gold.		Silver.		Total.	Gold.		Silver.		Total.
	Ozs.	Dolls.	Ozs.	Dolls.	Dolls.	Tons.	Ozs.	Dolls.	Ozs.	Dolls.	Dolls.	Ozs.	Dolls.	Ozs.	Dolls.	Dolls.
BAKER.																
Burnt River	405.0	8,390	1,160	1,500	9,890	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chicken Creek	208.4	4,308	.....	.....	4,308	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Conner Creek	*2,455.5	*50,760	.....	.....	*50,760	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pocahontas	1,001.4	20,701	.....	.....	20,701	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rye Valley	7.1	147	2,171	2,807	2,954	.....	.....	.....	.....	.....	.....	4.3	0 89	1,285	1,661	1,750
Silver Creek	.....	.....	.....	.....	.....	130	188.7	3,901	3,017	3,901	7,802	.....	.....	.....	.....	.....
Virtue	677.2	13,999	.....	.....	13,999	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	4,755.5	98,305	3,331	4,307	102,612	130	188.7	3,901	3,017	3,901	7,802	4.3	89	1,285	1,661	1,750
GRANT.																
Granite	3,300.2	68,221	10,540	13,639	81,860	185	894.0	18,499	28,617	36,999	55,498	.....	.....	.....	.....	.....
Total	3,300.2	68,221	10,540	13,639	81,860	185	894.0	18,499	28,617	36,999	55,498	.....	.....	.....	.....	.....
JOSEPHINE.																
Yank	220.8	4,750	.....	.....	4,750	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	220.8	4,750	.....	.....	4,750	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

*Estimated.

TABLE CXLVI.—OREGON—RECAPITULATION BY COUNTIES OF PRODUCTION OF DEEP MINES FOR THE YEAR ENDING MAY 31, 1880.

County.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.		
		Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
	Tons.	Dollars.	Dollars.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Dolls.	Dolls.	Dolls.
Baker	12,737	11 00	1 59	12 59	6,776.9	140,091	15,713	20,315	160,406	12,607	7 80	84	8 14
Grant	1,200	76 87	45 88	122 75	4,462.1	92,240	42,579	55,051	147,291	1,015	67 21	13 43	80 64
Josephine	150	*34 83	.....	*34 83	*252.7	*5,224	.....	.....	*5,224	150	31 00	.....	31 00
Total	14,087	16 80	5 35	22 21	11,491.7	237,555	58,292	75,366	312,921	13,772	12 44	1 30	13 74

County.	Bullion produced from ore raised and treated during census year.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.					Bullion produced during census year from ore previously raised.				
	Gold.		Silver.		Total.		Gold		Silver.		Total.	Gold.		Silver.		Total.
	Ounces.	Dollars.	Ozs.	Dollars.	Dollars.	Tons.	Ozs.	Dolls.	Ozs.	Dolls.	Dolls.	Ozs.	Dolls.	Ozs.	Dolls.	Dolls.
Baker	4,755.5	98,305	3,331	4,307	102,612	130	188.7	3,901	3,017	3,901	7,802	4.3	0 80	1,285	1,661	1,750
Grant	3,300.2	68,221	10,549	13,639	81,860	185	894.9	18,499	28,017	36,909	55,408	.....	.....	.....	.....	.....
Josephine	229.8	4,750	.....	.....	4,750	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	8,285.5	171,276	13,880	17,946	189,222	315	1,083.6	22,400	31,034	40,900	63,300	4.3	80	1,285	1,661	1,750

* Estimated.

TABLE CXLVII.—OREGON—PRODUCTION (GOLD) OF HYDRAULIC, PLACER, DRIFT, AND RIVER MINES FOR THE YEAR ENDING MAY 31, 1880.

County and district.	Gold.			
	Total by districts.		Total by counties.	
	Ounces.	Dollars.	Ounces.	Dollars.
BAKER.				
Amelia	290.2	5,999	7,262.8	150,135
Blue Cañon	333.8	6,900		
Chicken Creek	259.3	5,360		
Humboldt Basin	435.4	9,001		
Mormon Basin	130.6	2,700		
Pocahontas	1,805.2	37,317		
Rye Valley	1,112.6	22,999		
Shasta	747.4	15,450		
Sumter	1,632.6	33,749		
Willow Creek	515.7	10,660		
COOS.				
Black Hawk	3.6	74	3.6	74
CURRY.				
Sixes River	453.5	9,375	453.5	9,375
DOUGLAS.				
Big Bend, Cow Creek	177.6	3,671	620.5	12,827
Cañonville	237.7	4,914		
Green Mountain	205.2	4,242		
GRANT.				
Cañon City	6,482.3	134,001	14,096.5	291,401
Elk Creek	4,837.5	100,000		
Granite	353.1	7,299		
Marysville	774.0	16,000		
Prairie City	967.5	20,000		
Rock Creek	203.2	4,201		
Trail Creek	478.9	9,900		
JACKSON.				
Applegate	261.2	5,400		
Ashland	106.8	2,208		

County and district.	Gold.			
	Total by districts.		Total by counties.	
	Ounces.	Dollars.	Ounces.	Dollars.
JACKSON—continued.				
Coyote Creek	322.9	6,675	9,132.7	188,700
Dry Diggings	145.1	3,000		
Farris Gulch	290.1	5,997		
Fort Lane	435.4	9,001		
Forty-Nine	285.9	5,910		
Grass Creek	290.3	6,001		
Jackass Creek	967.5	20,000		
Jacksonville	822.3	16,998		
Rogue River	483.8	10,001		
Sam's Valley	35.6	736		
Sardine Creek	1,161.0	24,000		
Sterling	1,511.3	31,241		
Uniontown	1,068.4	22,499		
Willow Springs	361.8	7,479		
Wolf Creek	563.3	11,644		
JOSEPHINE.				
Althouse	2,418.8	50,001	9,503.4	196,458
Cañon Creek	483.8	10,001		
Grass Creek	102.1	3,971		
Illinois	967.5	20,000		
Josephine	725.6	15,000		
Murphy	27.0	558		
Silver Creek	725.6	15,000		
Waldo	799.5	16,527		
Yank	3,183.5	65,395		
UMATILLA.				
Scattered	3,680.4	76,080	3,680.4	76,080
WASCO.				
Ochoco	58.1	1,201	58.1	1,201
	44,811.5	926,336	44,811.5	926,336

WASHINGTON.

Of the small product reported from the deep mines of Washington territory, nearly the whole comes from Peshaston district, in Yakima county, where gold quartz mining is conducted on a small scale.

The Upper Columbia placers furnish over one-half of the total placer yield of the territory. The Skagit mines, in Whatcom county, about which, from time to time, reports glittering with golden promise have been spread, are not yet to be numbered among the important productive deposits of the country. They have attracted much attention from the press, and have been the scene of several incipient "rushes", but the shortness of the season, inaccessibility, and other natural disadvantages have combined to retard operations, and the yield is still very scanty.

TABLE CXLVIII.—WASHINGTON—PRODUCTION OF DEEP MINES FOR THE YEAR ENDING MAY 31, 1880.

County.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.		
		Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
	Tons.	Dolls.	Dolls.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Dolls.	Dolls.	Dolls.
Yakima (Peshaston district)	437	*41 85	Trace.	*41 85	884.6	*18,286	.....	.....	*18,286	437	31 59	Trace.	31 59
Scattered	100	37 50	Trace.	37 50	181.4	3,750	.....	.....	3,750	100	30 00	Trace.	30 00
Total	537	41 04	Trace.	41 04	1,066.0	22,036	.....	.....	22,036	537	31 28	Trace.	31 28

County.	Bullion produced from ore raised and treated during census year.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.					Bullion produced during census year from ore previously raised.				
	Gold.		Silver.		Total.		Gold.		Silver.		Total.	Gold.		Silver.		Total.
	Ozs.	Dollars.	Ozs.	Dolls.	Dollars.	Tons.	Ozs.	Dolls.	Ozs.	Dolls.	Dolls.	Ozs.	Dolls.	Ozs.	Dolls.	Dolls.
Yakima (Peshaston district)	667.6	13,801	.....	.....	13,801	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Scattered	145.1	2,999	.....	.....	2,999	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	812.7	16,800	.....	.....	16,800	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

*Estimated.

TABLE CXLIX.—WASHINGTON—PRODUCTION (GOLD) OF HYDRAULIC, PLACER, DRIFT, AND RIVER MINES FOR THE YEAR ENDING MAY 31, 1880.

Locality.	Gold.	
	Ounces.	Dollars.
Whatcom county, Skagit mines	193.5	4,000
Yakima county, Swauk mines	483.7	9,999
Upper Columbia placers	2,902.5	60,000
All other placers	2,176.9	45,001
Total	5,756.6	119,000

ALASKA.

This vast territory, occupying an area of over half a million square miles, is for the most part still an unexplored region. The small amount of prospecting which has been done has developed the fact that Alaska contains many gold-bearing localities, none of which, however, have yet yielded any considerable output. The climate and remoteness from communications will always be obstacles in the way of mining, but in spite of the natural disadvantages of the country, it is reasonable to look for an increased product in the future. Recent reports, much exaggerated, of fabulous discoveries of mountains of silver ore have attracted many adventurous miners to Alaska. Thus far only disappointment has resulted. The small amount of placer gold received at the San Francisco mint from Alaska during the census year, $5,951, does not perhaps represent the whole product, as a portion may have found its way to Victoria, and thus have become identified with the product of British Columbia. No means of tracing this small possible balance are at hand. The total was in any event insignificant.

STATISTICS OF THE DIVISION OF THE ROCKY MOUNTAINS.

[Collected and compiled under the direction of Mr. S. F. Emmons, geologist-in-charge and special agent of census.]

COLORADO.

From an average production of only three or four millions, Colorado has suddenly risen to the first rank as a producer of the precious metals among the states and territories for gold and silver combined; as for silver alone it ranks first, while for gold it holds the fourth rank. In the relation of production to area, it holds the first rank, likewise, for gold and silver combined and for silver alone, and the third for gold alone. In the relation of production to population, however, it ranks only third for gold and silver together, second for silver alone, and sixth for gold alone. The total value of its product during the census year in gold and silver was, in round numbers, nineteen and a quarter million dollars, and if we add to this the value of lead and copper in crude metal produced, we have a total value of metallic product of twenty-two and three-quarters million dollars.

The collection of statistics of the precious metals in this state presents certain peculiar difficulties. First, from the fact that there are so many small mines which keep no accurate record of their production; second, because a very large proportion of its ores, being essentially heterogeneous in composition, have to be smelted, and are thus more difficult to trace than milling ores. The smelting ores are sold, it is true, mostly to smelters within the state, but the same mine often sells to different and widely separated works, and the smelters themselves buy ores in small lots from many mines, of which no separate record is kept. Moreover, the check furnished in the more western states over the total production by the express returns is here wanting, since, practically, the whole silver product is shipped east in lead bullion, of which the transportation companies keep no record. Nevertheless, owing to the almost uniform willingness which the more important mine-owners, samplers, and smelters have shown to afford the data which they possessed, it is believed that the totals attained represent a very close approximation to the actual product of the state, and that the figures given are, on the average, within 5 per cent. of the true amount, although in districts as yet incompletely developed this percentage may be greater.

As it was found impossible to separate with any degree of approximation the amount of "bullion produced", which should be credited to individual districts in several counties, the division into districts has been abandoned in such instances. In the following tables the amount and value of ore raised has been given to districts as far as was possible, the heading "Scattered" including, in general, mines from which no direct information was obtained, but which had sold ore to samplers or smelters. The sign of "estimated" (*) might be appended in many cases to amounts of bullion produced by counties, because these amounts were largely obtained by segregating returns of ore purchased by smelters, and apportioning to each county the corresponding proportion of bullion produced from that ore; thus, while the relative amounts may be considered estimates, the total footings of the columns are determined from comparatively accurate data.

TABLE CL.—COLORADO—STATEMENT OF ORE RAISED DURING THE YEAR ENDING MAY 31, 1880.

County and district.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.				
		Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.
	Tons.	Dollars.	Dollars.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.
BOULDER.									
Central, Gold Hill, Grand Island, Sugar Loaf, Ward	5,607.0	77 56	63 81	141 37	21,262.0	439,524	279,712	361,640	801,164
Scattered	2,201.0	8 22	12 52	20 74	875.0	18,088	21,313	27,555	45,643
Total	7,868.0	58 17	49 46	107 63	22,137.0	457,612	301,025	389,195	846,807
CHAFFEE.									
Chalk Creek, Free Gold, Monarch	944.0	17 91	170 24	188 15	818.0	16,910	124,296	160,702	177,612
Scattered	35.0	92 71	209 43	302 14	157.0	3,245	5,069	7,330	10,575
Total	979.0	20 58	171 64	192 22	975.0	20,155	129,365	168,032	188,187
CLEAR CREEK.									
Argentine, Banner, Cascade, Chicago, Geneva, Griffith, Idaho, Iowa, Montana, Morris, Queen, Seaton, Spanish Bar, Trail Run, Upper Union, Virginius	34,524.0	10 81	46 97	57 78	18,055.0	373,280	1,254,025	1,621,329	1,994,559
Scattered	2,511.0	1 12	133 70	134 82	136.0	2,811	257,729	333,218	336,029
Total	37,031.0	10 15	52 79	62 94	18,191.0	376,041	1,511,754	1,954,547	2,330,588

TABLE CL.—COLORADO—STATEMENT OF ORE RAISED, ETC.—Continued.

County and district.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.				
		Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.
	Tons.	Dollars.	Dollars.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.
CUSTER.									
Hardscrabble, Verde	15,802.0	04	36 49	36 53	30.0	620	446,040	576,693	577,313
Scattered	292.0	47 85	73 83	121 68	676.0	13,974	16,675	21,559	35,533
Total	16,094.0	91	37 17	38 08	706.0	14,594	462,721	598,252	612,846
GILPIN.									
Enterprise, Eureka, Gregory, Hawkeye, Nevada, Quartz Valley, Russell	110,745.0	14 80	4 35	19 21	70,590.0	1,645,271	372,956	482,195	2,127,466
Scattered	12,923.0	28 39	14 90	43 29	17,747.0	366,863	148,915	192,532	559,395
Total	123,668.0	16 27	5 46	21 73	97,337.0	2,012,134	521,871	674,727	2,686,861
GUNNISON.									
Ruby, Tin Cup	140.0	7 56	1,242 21	1,249 77	51.2	1,058	134,512	173,910	174,968
Scattered	112.0	71 62	69 55	141 17	388.0	8,021	6,025	7,790	15,811
Total	252.0	36 03	721 03	757 06	439.2	9,079	140,537	181,700	190,779
HINSDALE.									
Galena, Lake	2,371.0	3 40	65 10	68 50	400.0	8,269	119,390	154,359	162,628
Scattered	324.0	.....	101 25	101 25	.....	.....	25,372	32,804	32,804
Total	2,695.0	3 07	69 45	72 52	400.0	8,269	144,762	187,163	195,432
HUERFANO.									
Third	35.0	20 69	96 97	117 66	35.0	724	2,625	3,394	4,118
Total	35.0	20 69	96 97	117 66	35.0	724	2,625	3,394	4,118
LAKE.									
California	152,241.0	23	90 05	90 28	1,710.0	35,473	10,993,331	13,709,047	13,744,520
Scattered	210.0	224 83	85 48	310 31	2,284.0	47,214	13,885	17,952	65,166
Total	152,451.0	54	90 04	90 58	4,000.0	82,687	10,617,216	13,726,999	13,809,686
LA PLATA.									
California	12.0	10 00	246 75	256 75	5.8	120	2,290	2,961	3,081
Total	12.0	10 00	246 75	256 75	5.8	120	2,290	2,961	3,081
OURAY.									
Iron Spring	423.5	118 10	312 45	430 61	2,449.2	50,629	103,555	133,886	184,515
Pioneer	100.0	22 95	144 94	167 89	111.0	2,295	11,210	14,493	16,788
Sneffles	94.5	1 05	377 75	378 80	4.8	99	27,612	35,700	35,799
Uncompahgre	820.0	11 73	33 47	45 20	465.5	9,623	21,225	27,442	37,065
Upper San Miguel	207.5	43 50	158 98	202 57	437.5	9,044	25,515	32,988	42,032
Scattered	130.5	17 41	233 65	251 06	117.5	2,429	25,210	32,594	35,023
Total	1,700.0	41 41	154 81	196 22	3,585.5	74,119	214,327	277,103	351,222
PARK.									
Buckskin	50.0	.....	181 00	181 00	.....	.....	7,000	9,050	9,050
Horseshoe	1,500.0	.....	103 43	103 43	.....	.....	120,000	155,148	155,148
Montgomery	774.0	.....	158 02	158 02	.....	.....	94,598	122,306	122,306
Mosquito	818.0	7 22	139 45	146 67	285.7	5,906	88,230	114,073	119,979
Sacramento	395.0	.....	145 68	145 68	.....	.....	92,257	119,279	119,279
Scattered	1,827.0	70	144 72	145 48	67.0	1,385	204,500	264,398	265,783
Total	5,364.0	1 36	146 21	147 57	352.7	7,291	606,585	784,254	791,545
RIO GRANDE.									
Summit	550.0	15 50	.....	15 50	412.5	8,527	.....	.....	8,527
Total	550.0	15 50	.....	15 50	412.5	8,527	.....	.....	8,527
SAN JUAN.									
Animas	1,035.0	.....	116 43	116 43	.....	.....	93,205	120,505	120,505
Eureka	150.0	.....	139 98	139 98	.....	.....	16,240	20,997	20,997
Uncompahgre	1,350.0	.....	107 12	107 12	.....	.....	111,696	144,412	144,412
Scattered	190.0	10 50	236 16	246 66	96.5	1,995	34,706	44,871	46,866
Total	2,725.0	73	121 80	122 12	96.5	1,995	255,847	330,785	332,780
SUMMIT.									
Avalanche	600.0	10 33	.....	10 33	390.0	6,202	.....	.....	6,202
Revere	75.0	103 36	19 89	122 75	375.0	7,752	1,125	1,454	9,206
Horn Silver	400.0	10 34	86 62	96 96	200.0	4,134	*26,800	34,650	38,784
Ten-Mile	3,200.0	.....	112 85	112 85	.....	.....	279,300	361,107	361,107
Scattered	571.0	.....	33 20	33 20	.....	.....	*14,664	18,950	18,950
Total	4,846.0	3 73	85 88	89 61	875.0	18,088	321,889	416,170	434,258

* Estimated.

Park county.—At the time of collecting these statistics accurate data could be obtained from but few of the producing mines of this county; it has been necessary, therefore, to deduce them largely from information obtained from samplers and smelters, and estimate their proportionate bullion yield.

Rio Grande county.—Here, also, returns were obtained from but a single district.

San Juan county.—To this the same remarks are applicable which were made in regard to Ouray county.

Summit county.—From this county, for various reasons, the returns as regards the census year are rather incomplete, and figures probably below the truth. The bullion produced also had to be largely estimated. The following years will probably show an increased production.

To show the data from which the figures given above have been obtained the number of mines from which full schedules were received is subjoined, and the proportion thereof that have been bullion-producers during the census year, as well as those producers of which data have been obtained otherwise than by schedules and visits of census experts:

Total deep mines scheduled	249
Productive mines scheduled	126
Productive mines reported otherwise	249
Total productive mines reported	375
Total all mines reported on	498

TABLE CLII.—COLORADO—PRODUCTION OF PLACER MINES FOR THE YEAR ENDING MAY 31, 1880.

County.	Gold.	
	Ounces.	Dollars.
Chaffee	1,275.0	26,357
Clear Creek	410.0	8,475
Lake	835.0	17,261
Park	1,000.0	20,672
Routt	241.9	5,001
Summit	1,160.0	23,979
Total	4,921.9	101,745

The above table gives all the data which were obtained by the experts engaged in this work on placer and hydraulic workings in the state. The inherent difficulty of obtaining complete information with regard to surface mining, in that it is carried on only during a limited portion of the year, and in great part by individuals who keep no accurate account of their gains, renders these returns necessarily incomplete here as elsewhere. In Colorado, moreover, owing to the fact that other gold bullion is produced so largely, it has been impossible to supplement these figures by express or mint returns. While the above figures doubtless very inadequately express the production of placer gold for the state, it is a fact that this production was relatively small during the census year, owing to the unusual activity in prospecting for and working deep mines.

COPPER AND LEAD PRODUCTION IN COLORADO.

Although copper and lead belong rather to the useful than to the precious metals, their importance among the mineral products of Colorado, and their intimate connection with the production of gold and silver, render their consideration here essential. In Table CLIII, given below, only the crude metal obtained from ores actually smelted within the state is given, no account being taken of the copper or lead contained in ores which were shipped outside of the state for treatment. This amount is, however, of comparatively little importance, forming probably not over 5 per cent. of the total product. The lead product was all in the form of argentiferous lead bullion, which was shipped to various smelters in the East to be refined.

The copper product was partly as matte, but largely in the form of copper oxide. Of the actual shipments of the latter a portion has been produced from ores raised in Montana; a proportionate amount of the total product has, however, been credited to that territory in its appropriate place.

In calculating the value of these metals the average market value of either for the year has been assumed as 4½ cents per pound for lead, 20 cents per pound for copper.

TABLE CLIII.—COLORADO—CRUDE BULLION PRODUCT FOR THE YEAR ENDING MAY 31, 1880.

County.	Gross tons.	Lead.		Copper.		Gold.		Silver.		Total.
		Tons.	Dollars.	Tons.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.
Arapahoe	1,225			980	392,000					392,000
Hinsdale	800	790.00	71,100			270.0	5,581	96,878	125,254	201,935
Jefferson	1,117	525.75	47,318	598	239,200	10,315.0	213,231	565,020	730,514	1,230,263
Lake	28,383	28,226.00	2,540,340			3,830.2	79,177	8,053,040	10,412,947	13,032,464
Ouray	90	89.00	8,010					24,103	31,163	39,173
Park	57	56.00	5,040					11,996	15,510	20,550
Pueblo	2,191	2,126.50	191,385			1,347.0	27,845	1,557,608	2,013,831	2,233,061
Summit	260	256.00	23,040					10,400	13,446	36,486
Total	34,123	32,069.25	2,886,233	1,578	631,200	15,762.2	325,834	10,310,951	13,342,665	17,185,932

Lead, $90 per ton. Copper, $400 per ton.

In the subjoined table are shown the relative amounts of ore treated by mill process and by smelting, and their average yield per ton. Its principal value is to show the average character of ore in each county in reference to its adaptation to either process of reduction. It would have been extremely interesting, had the data been such as would yield accurate results, to have given the assay value of the ore treated in either case, and thus compare the relative losses in either process, but the number of cases in which it has been necessary to estimate product from assay value, or *vice versâ*, would seriously impair the value of such comparison. This subject will be found treated at length in another part of the report.

TABLE CLIV.—COLORADO—PRODUCTION OF SMELTING WORKS AND AMALGAMATING MILLS FOR THE YEAR ENDING MAY 31, 1880.

County.	Ore raised and smelted.	Average yield per ton.			Bullion produced from ore smelted during census year.				
		Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.
	Tons.	Dollars.	Dollars.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.
Boulder	3,412.0	68 52	47 10	115 62	11,809.8	233,794	124,307	160,717	394,511
Chaffee	161.0	*0 33	*46 65	*52 98	*49.3	*1,019	*5,809	*7,510	*8,529
Clear Creek (*a*)	9,701.0	11 93	116 26	128 19	*5,599.3	*115,748	*872,344	*1,127,854	*1,243,602
Custer (*b*)	982.0	14 24	64 65	78 89	676.2	13,978	49,107	63,490	77,468
Gilpin	10,218.0	48 36	28 26	76 62	23,901.5	494,088	223,305	288,711	782,799
Gunnison	252.0	18 11	100 00	118 11	*220.3	*4,554	19,507	25,221	29,775
Hinsdale	2,695.0	2 61	13 09	15 70	277.8	5,743	99,058	129,236	134,979
Huerfano	5.5	.....	57 27	57 27	.....	.....	244	315	315
Lake	140,623.0	58	89 34	89 92	3,913.7	80,903	9,717,819	12,564,168	12,645,071
La Plata	12.0	8 58	226 00	234 58	5.0	103	2,098	2,713	2,816
Ouray	1,015.0	6 66	100 62	107 28	327.0	6,760	78,995	102,133	108,893
Park	5,304.0	*18	*95 67	*95 85	*46.0	*951	*396,921	*513,179	*514,130
Rio Grande	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Juan	1,353.0	*1 29	*104 31	*105 60	*84.0	*1,736	*109,106	*141,141	*142,877
Summit	3,771.0	.....	*93 91	*93 91	.....	.....	*273,015	*354,145	*354,145
Total	179,564.5	5 34	86 21	91 55	46,409.9	959,377	11,973,495	15,480,533	16,439,910

County.	Ore raised and milled.	Average yield per ton.			Bullion produced from ore milled during census year.				
		Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.
	Tons.	Dollars.	Dollars.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.
Boulder	4,146	17 05	46 58	63 63	3,413.5	70,607	149,381	193,195	263,802
Chaffee	.....	.....	.....	.....	.....	.....	.....	.....	.....
Clear Creek (*a*)	11,736	8 78	46 54	55 32	*4,983.0	*103,008	*422,430	*546,160	*649,168
Custer (*b*)	1,118	38	7 88	8 26	20.0	413	6,820	8,818	9,231
Gilpin	113,427	9 91	30	10 21	54,361.9	1,123,760	26,769	34,610	1,158,370
Gunnison	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hinsdale	.....	.....	.....	.....	.....	.....	.....	.....	.....
Huerfano	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lake	.....	.....	.....	.....	.....	.....	.....	.....	.....
La Plata	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ouray	290	33 35	2 86	36 21	477.5	9,871	656	848	10,719
Park	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rio Grande	550	9 79	.....	9 79	265.5	5,385	.....	.....	5,385
San Juan	.....	.....	.....	.....	.....	.....	.....	.....	.....
Summit	675	*7 66	.....	*7 66	*250.0	*5,168	.....	.....	*5,168
Total	131,948	9 99	5 94	15 93	63,771.4	1,318,272	606,056	783,571	2,101,843

*Estimated. *a* 14,384 tons lost by concentration. *b* 4,684 tons lost by concentration.

DAKOTA.

The metallic production of Dakota is derived from the region of the Black Hills, and in greater part from Lawrence county, where free-milling gold-quartz ores of low grade are reduced in amalgamating mills of great size. The perfection to which the milling process has been brought is shown by the large percentage of the assay value extracted. Custer and Pennington counties are opening new mines, but had scarcely become producers during the census year.

The following table gives the production of deep mines, by districts, for the Black Hills region:

TABLE CLV.—DAKOTA—PRODUCTION OF DEEP MINES FOR THE YEAR ENDING MAY 31, 1880.

County and district.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.		
		Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
	Tons.	Dollars.	Dollars.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Dollars.	Dollars.	Dollars.
CUSTER.													
Cole	300	21 33	0 02	21 35	309.6	6,400	3	4	6,404	.....	.....	.....	.....
Custer	1,950	12 74	08	12 82	1,202.1	24,850	119	154	25,004	.....	.....	.....	.....
Total	2,250	13 89	07	13 96	1,511.7	31,250	122	158	31,408	.....	.....	.....	.....
LAWRENCE.													
Bear Butte	4,420	3 56	13 03	16 59	761.9	15,750	44,534	57,578	73,328	1,905	41	15 34	15 75
Lost Placer	78,060	8 00	11	8 11	30,209.2	624,480	6,381	8,250	632,730	71,060	7 53	08	7 61
Whitewood	444,518	7 63	25	7 88	164,092.2	3,392,086	85,275	110,252	3,502,338	422,665	0 16	08	6 24
Total	526,998	7 65	34	7 99	195,063.3	4,032,316	136,190	176,080	4,208,396	495,630	0 33	15	6 48
PENNINGTON.													
Cross	250	57 00	2 00	59 00	689.3	14,249	387	500	14,749	.....	.....	.....	.....
Newton Forks	850	9 27	24	9 51	381.2	7,880	154	199	8,079	.....	.....	.....	.....
Rockford	6,400	8 62	.....	8 62	2,668.4	55,161	.....	.....	55,161	500	3 20	.....	3 20
Total	7,500	10 31	09	10 40	3,738.9	77,290	541	699	77,989	500	3 20	.....	3 20

County and district.	Bullion produced from ore raised and treated during census year.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.					Bullion produced during census year from ore previously raised.				
	Gold.		Silver.		Total.		Gold.		Silver.		Total.	Gold.		Silver.		Total.
	Ounces.	Dollars.	Ozs.	Dolls.	Dollars.	Tons.	Ounces.	Dolls.	Ozs.	Dolls.	Dolls.	Ozs.	Dolls.	Ozs.	Dolls.	Dolls.
CUSTER.																
Cole	.....	.....	.....	.....	.....	300	309.6	6,400	3	4	6,404	.....	.....	.....	.....	.....
Custer	.....	.....	.....	.....	.....	1,950	1,202.1	24,850	119	154	25,004	.....	.....	.....	.....	.....
Total	.....	.....	.....	.....	.....	2,250	1,511.7	31,250	122	158	31,408	.....	.....	.....	.....	.....
LAWRENCE.																
Bear Butte	37.5	775	22,614	29,238	30,013	2,515	577.8	11,944	15,731	20,339	32,283	.....	.....	.....	.....	.....
Lost Placer	25,882.8	535,045	4,621	5,974	541,019	7,000	2,708.9	55,998	580	750	56,748	.....	.....	.....	.....	.....
Whitewood	125,839.4	2,601,331	27,342	35,351	2,636,682	21,853	9,335.0	192,972	8,480	10,899	203,871	5,622.7	116,233	.....	.....	116,233
Total	151,759.7	3,137,151	54,577	70,563	3,207,714	31,368	12,621.7	260,914	24,741	31,988	292,902	5,622.7	116,233	.....	.....	116,233
PENNINGTON.																
Cross	.....	.....	.....	.....	.....	250	689.3	14,249	387	500	14,749	.....	.....	.....	.....	.....
Newton Forks	.....	.....	.....	.....	.....	850	381.2	7,880	154	199	8,079	.....	.....	.....	.....	.....
Rockford	77.4	1,600	.....	.....	1,600	5,900	2,549.4	52,701	.....	.....	52,701	.....	.....	.....	.....	.....
Total	77.4	1,600	.....	.....	1,600	7,000	3,619.9	74,830	541	699	75,529	.....	.....	.....	.....	.....

The following table is a condensation of the preceding, and gives the deep-mine production by counties only:

TABLE CLVI.—DAKOTA—RECAPITULATION BY COUNTIES OF PRODUCTION OF DEEP MINES FOR THE YEAR ENDING MAY 31, 1880.

County.	Ore raised during census year.	Average assay value per ton.			Assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.		
		Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
	Tons.	Dollars.	Dollars.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Dollars.	Dollars.	Dollars.
Custer	2,250	13 89	0 07	13 96	1,511.7	31,250	122	158	31,408	.....	.....	.....	.....
Lawrence	526,998	7 65	34	7 99	195,063.3	4,032,316	136,100	176,080	4,208,396	495,630	6 33	0 15	6 48
Pennington	7,500	10 31	09	10 40	3,738.9	77,290	541	699	77,989	500	3 20	.....	3 20
Total	536,748	7 71	33	8 04	200,313.9	4,140,856	136,853	176,937	4,317,793	496,130	6 33	14	6 47

County.	Bullion produced from ore raised and treated during census year.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.					Bullion produced during census year from ore previously raised.				
	Gold.		Silver.		Total.		Gold.		Silver.		Total.	Gold.		Silver.		Total.
	Ounces.	Dollars.	Ozs.	Dolls.	Dollars.	Tons.	Ounces.	Dolls.	Ozs.	Dolls.	Dolls.	Ozs.	Dolls.	Ozs.	Dolls.	Dolls.
Custer	.....	.....	.....	.....	.....	2,250	1,511.7	31,250	122	158	31,408	.....	.....	.....	.....	.....
Lawrence	151,750.7	3,137,151	54,577	70,563	3,207,714	31,368	12,621.7	260,914	24,741	31,988	292,902	5,622.7	116,233	.....	.....	116,233
Pennington	77.4	1,600	.....	.....	1,600	7,000	3,610.9	74,830	541	699	75,529	.....	.....	.....	.....	.....
Total	151,827.1	3,138,751	54,577	70,563	3,209,314	40,618	17,753.3	366,994	25,404	32,845	399,839	5,622.7	116,233	.....	.....	116,233

PLACER AND HYDRAULIC MINES.

The following table gives the production of hydraulic and placer mines so far as could be ascertained by the expert in charge of this district. The amount seems very small, compared with the supposed value of the surface deposits in this region. This may be in part accounted for by the fact that several important companies were making ditches, and preparing for work on a large scale, but had not become producers during the census year.

TABLE CLVII.—DAKOTA—PRODUCTION OF HYDRAULIC, PLACER, DRIFT, AND RIVER MINES FOR THE YEAR ENDING MAY 31, 1880.

		Ounces.	Dollars.
Lawrence county	Gold	2,307.5	47,700
Pennington county	do	152.8	3,159
Total		2,460.3	50,859

MONTANA.

Montana has within its boundaries the elements favorable to a large production of the precious metals—rich and varied ores and abundant fuel, both coal and wood. As yet, however, owing to lack of development and want of sufficient transportation facilities, it has not taken its proper rank as a producer. Owing to the great extent of territory over which its mines are scattered, and the fact that, from circumstances beyond our control, the collection of statistics was not completed until the winter was far advanced, and travel rendered thereby very difficult, our data leave something to desire in point of completeness. It was evident that the figures of gold production deduced from the schedules were below the truth, since the mint returns report the gold production of Montana as a little over a million dollars in excess. As the mint figures are certainly below the truth, it was proper that this difference should be added, the only question being to what branch of mining it should be credited. Now, the census returns from placer and hydraulic mines were notoriously incomplete, since, owing to the lateness of the season, but few of their owners could be found; but it is well known that they form the most important element in the gold production of Montana. On the other hand, it was thought that returns had been obtained from practically all the mills and smelting works. Under these circumstances it was judged best to discard the census figures for hydraulic and placer mines altogether, and assume as their production the difference between the amount of gold produced, as determined by mill and smelters' returns, and the total product obtained from mint returns. While, therefore, it is possible that a small amount of the gold credited to hydraulic and placer mines may belong to mill production, it is probably not more than that by which the mint returns fall short of giving the total gold production of the territory as gold which, for various reasons, has not passed through the hands of its agents.

The following table gives the production of the deep mines of Montana by districts, and the yield of the ore treated, as far as could be ascertained, though some small lots of ore are known to have been shipped east, which could not be traced:

TABLE CLVIII.—MONTANA—PRODUCTION OF DEEP

	County and district.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.		
			Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
		Tons.	Dolls.	Dolls.	Dolls.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Dolls.	Dolls.	Dolls.
	BEAVER HEAD.													
1	Bald Mountain	300	.....	53 87	53 87	.....	.....	12, 501	16, 163	16, 163	300. 0	.. ....	26 67	26 67
2	Bannock	1, 190	20 43	34	20 77	1, 176. 2	24, 314	309	399	24, 713	1, 190. 0	16 59	25	16 84
3	Trapper	9, 446	.....	109 62	109 62	.....	.....	800, 917	1, 035, 506	1, 035, 506	9, 412. 0	.....	76 61	76 61
	Total	10, 936	2 22	96 19	98 41	1, 176. 2	24, 314	813, 727	1, 052, 068	1, 076, 382	10, 902. 0	1 81	60 90	68 71
	DEER LODGE.													
1	Flint Creek	5, 315	.....	81 45	81 45	.....	.....	334, 830	432, 902	432, 902	3, 748. 0	... .	52 63	52 63
2	Independence	4, 100	1 17	69 69	70 86	232. 2	4, 809	221, 000	285, 731	290, 531	888. 0	.....	71 60	71 60
3	Silver Creek	19, 000	13 00	47	13 47	11, 948. 6	247, 000	6, 884	8, 900	255, 900	14, 000. 0	12 00	50	12 50
4	Summit Valley	52, 841	4 98	55 72	60 70	12, 729. 9	263, 150	2, 277, 484	2, 944, 559	3, 207, 709	38, 393. 0	4 42	44 75	49 17
	Total	81, 256	6 34	45 19	51 53	24, 910. 7	514, 950	2, 840, 198	3, 672, 092	4, 187, 042	57, 029. 0	5 92	34 83	40 75
	JEFFERSON.													
1	Cataract	500	192 00	6 98	198 98	4, 644. 0	96, 000	2, 700	3, 491	99, 491	203. 0	26 06	.....	26 06
2	Cedar Plain	800	32 00	4 00	36 00	1, 238. 4	25, 600	2, 475	3, 200	28, 800	800. 0	16 00	2 00	18 00
3	Colorado	540	41 34	83 80	125 14	1, 080. 0	22, 326	35, 090	45, 252	67, 578	540. 0	12 28	70 17	82 45
4	Elkhorn	600	.....	77 57	77 57	.....	....	36, 000	46, 544	46, 544	600. 0	.....	58 18	58 18
5	Mountain	325	90 00	.....	90 00	1, 415. 0	29, 251	.....	.....	29, 251	325. 0	70 00	.....	70 00
6	Scattered	570	16 00	1 00	17 00	441. 2	9, 120	441	570	9, 690	570. 0	15 26	28	15 54
	Total	3, 335	54 66	29 70	84 36	8, 818. 6	182, 297	76, 616	99, 057	281, 354	3, 038. 0	18 49	24 54	43 03
	LEWIS AND CLARKE.													
1	Silver Creek, or Ottawa	7, 150	16 40	5 17	21 57	5, 072. 4	117, 259	28, 600	36, 977	154, 236	7, 000. 0	13 14	1 15	14 29
2	Stemple	2, 843	14 62	10 31	24 93	*2, 010. 5	*41, 561	*22, 082	*29, 326	*70, 887	2, 843. 0	11 30	6 05	17 44
3	Owyhee	500	22 00	25	22 25	532. 1	10, 999	97	125	11, 124	500. 0	14 30	.....	14 30
	Total	10, 493	16 18	6 33	22 51	8, 215. 0	169, 819	51, 379	66, 428	236, 247	10, 343. 0	12 71	2 44	15 15
	MADISON.													
1	Hot Springs	929	81 75	12 58	94 33	3, 673. 8	75, 944	9, 040	11, 688	*87, 632	880. 5	80 52	09	30 61
2	Mineral Hill	155	192 69	4 52	197 41	*1, 446. 3	*29, 898	542	701	*30, 599	130. 0	90 00	2 20	92 20
3	Red Bluff	4	24 00	.....	24 00	*4. 7	*97	.....	.....	*97	4. 0	18 00	.....	18 00
4	Silver Star	7, 750	18 78	.....	18 78	*7, 041. 4	*145, 559	.....	.....	*145, 559	4, 250. 0	9 47	.....	9 47
	Total	8, 838	28 45	1 40	29 85	*12, 166. 2	*251, 498	9, 582	12, 389	*263, 887	5, 264. 5	16 49	07	16 56

* Estimated.

TABLE CLIX.—MONTANA—RECAPITULATION BY COUNTIES OF

	County.	Ore raised during census year.	Average assay value per ton.			Assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.		
			Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
		Tons.	Dolls.	Dolls.	Dolls.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Dolls.	Dolls.	Dolls.
1	Beaver Head	10, 936	2 22	96 19	98 41	1, 176. 2	24, 314	813, 727	1, 052, 068	1, 076, 382	10, 902. 0	1 81	66 90	68 71
2	Deer Lodge	81, 256	6 34	45 19	51 53	24, 910. 7	514, 950	2, 840, 198	3, 672, 092	4, 187, 042	57, 029. 0	5 92	34 83	40 75
3	Jefferson	3, 335	54 66	29 70	84 36	8, 818. 6	182, 297	76, 616	99, 057	281, 354	3, 038. 0	18 49	24 54	43 03
4	Lewis and Clarke	10, 493	16 18	6 33	22 51	8, 215. 0	169, 819	51, 379	66, 428	236, 247	10, 343. 0	12 71	2 44	15 15
5	Madison	8, 838	28 45	1 40	29 85	*12, 166. 2	*251, 498	9, 582	12, 389	*263, 887	5, 264. 5	16 49	07	16 56
	Total	114, 858	9 95	42 68	52 63	55, 286. 7	1, 142, 878	3, 791, 502	4, 902, 034	6, 044, 912	86, 576. 5	7 80	32 52	39 82

* Estimated.

MINES FOR THE YEAR ENDING MAY 31, 1880.

Bullion produced from ore raised and treated during census year.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.					Bullion produced during census year from ore previously raised.					
Gold.		Silver.		Total.		Gold.		Silver.		Total.	Gold.		Silver.		Total.	
Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Ozs.	Dolls.	Ozs.	Dolls.	Dolls.	
.....	.....	6,188	8,000	8,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
955.4	19,750	232	300	20,050	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
.....	.....	557,690	721,038	721,038	34.0	.....	.....	4,208	5,440	5,440	.....	.....	.....	.....	.....	3
955.4	19,750	564,110	729,338	749,088	34.0	.....	.....	4,208	5,440	5,440	.....	.....	.....	.....	.....	
.....	.....	152,597	197,293	197,293	1,567.0	.....	.....	101,621	131,386	131,386	.....	.....	40,487	52,346	52,346	1
.....	.....	49,178	63,582	63,582	3,212.0	232.2	4,800	162,548	210,158	214,958	.....	.....	.....	.....	.....	2
8,127.0	168,000	5,415	7,001	175,001	5,000.0	4,015.1	83,000	3,635	4,700	87,700	.....	.....	.....	.....	.....	3
8,210.7	169,730	1,328,944	1,718,192	1,887,922	14,448.0	1,620.3	33,494	584,433	755,613	789,107	203.2	4,200	21,321	27,566	31,766	4
16,337.7	337,730	1,536,134	1,986,068	2,323,798	24,227.0	5,867.6	121,294	852,237	1,101,857	1,223,151	203.2	4,200	61,808	79,912	84,112	
255.9	5,290	.....	.....	5,290	207.0	3,990.9	82,499	2,700	3,491	85,990	.....	.....	.....	.....	.....	1
619.2	12,800	1,237	1,600	14,400	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
320.7	6,629	29,300	37,894	44,523	.....	.....	.....	.....	.....	.....	11.3	234	1,029	1,330	1,564	3
.....	.....	27,000	34,908	34,908	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4
1,100.5	22,740	.....	.....	22,740	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5
420.9	8,701	124	160	8,861	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6
2,717.2	56,169	57,670	74,562	130,731	297.0	3,990.9	82,499	2,700	3,491	85,990	11.3	234	1,029	1,330	1,564	
4,448.9	91,967	6,244	8,073	100,040	150.0	119.0	2,460	600	776	3,236	.....	.....	.....	.....	.....	1
1,566.5	32,383	13,310	17,208	49,591	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
*345.0	*7,150	.....	.....	*7,150	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
6,361.3	131,500	19,554	25,281	156,781	150.0	119.0	2,460	600	776	3,236	.....	.....	.....	.....	.....	
1,683.2	34,795	62	80	34,875	48.5	101.8	3,965	472	610	4,575	133.5	2,760	.....	.....	2,760	1
566.0	11,700	230	298	11,998	25.0	236.9	4,897	86	111	5,008	.....	.....	.....	.....	.....	2
3.5	72	.....	.....	72	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
1,946.1	40,230	.....	.....	40,230	3,500.0	2,455.0	50,749	.....	.....	50,749	180.0	3,721	.....	.....	3,721	4
4,198.8	86,797	202	378	87,175	3,573.5	2,888.7	59,611	558	721	60,332	313.5	6,481	.....	.....	6,481	

*Estimated.

PRODUCTION OF DEEP MINES FOR THE YEAR ENDING MAY 31, 1880.

Bullion produced from ore raised and treated during census year.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.					Bullion produced from ore raised prior to census year.					
Gold.		Silver.		Total.		Gold.		Silver.		Total.	Gold.		Silver.		Total.	
Ounces.	Dolls.	Ounces.	Dollars.	Dollars.	Tons.	Ounces.	Dolls.	Ozs.	Dollars.	Dollars.	Ozs.	Dolls.	Ozs.	Dolls.	Dolls.	
955.4	19,750	564,110	729,338	749,088	34.0	.....	.....	4,208	5,440	5,440	.....	.....	.....	.....	.....	1
16,337.7	337,730	1,536,134	1,986,068	2,323,798	24,227.0	5,867.6	121,294	852,237	1,101,857	1,223,151	203.2	4,200	61,808	79,912	84,112	2
2,717.2	56,169	57,670	74,562	130,731	297.0	3,990.9	82,499	2,700	3,491	85,990	11.3	234	1,029	1,330	1,564	3
6,361.3	131,500	19,554	25,281	156,781	150.0	119.0	2,460	600	776	3,236	.....	.....	.....	.....	.....	4
4,198.8	86,797	202	378	87,175	3,573.5	2,888.7	59,611	558	721	60,332	313.5	6,481	.....	.....	6,481	5
30,570.4	631,946	2,177,760	2,815,627	3,447,978	28,281.5	12,861.2	265,864	860,303	1,112,285	1,378,149	528.0	10,915	62,837	81,242	92,157	

In Table CLVIII the following possible cause of error should be noted: In Summit Valley district, Deer Lodge county, owing to the incomplete character of some of the returns and the fact that many mines sell ore to both mills and smelters, there has been a possible duplication in estimating the bullion product. This overestimate, if such it really is, would not, however, amount to more than 500 tons, and is probably more than offset by the insufficiency of the data obtained. Considerable copper ore carrying silver goes out of the county for treatment, some of which could not be traced. Manganese ore, carrying some silver, is used by the smelters as flux, and is not accounted for in the "Tons raised"; but its yield should appear in the "Bullion produced".

Table CLIX, which is a condensation of Table CLVIII, gives the production of the deep mines of Montana by counties.

The following table shows the relative amounts of ore reduced in stamp-mills and by smelting works, with the average yield per ton and total contents in gold and silver in each case:

TABLE CLX.—MONTANA—ORE TREATED BY SMELTING WORKS AND AMALGAMATING MILLS.

	Ore treated.	Average yield per ton.			Bullion produced.				
		Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.
	Tons.	Dollars.	Dollars.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.
Smelted	14,680.0	64	78 36	79 00	454.4	9,393	889,362	1,140,856	1,150,249
Milled	71,896.5	8 65	23 18	31 83	30,116.0	622,553	1,288,398	1,665,770	2,288,323
Total	86,576.5	7 30	32 52	39 82	30,570.4	631,946	2,177,760	2,815,626	3,447,572

HYDRAULIC AND PLACER MINES.

The gravel deposits of Montana form an important source of its wealth, and their product is known to be very considerable. The figures for this product, as explained above, have been assumed, in the absence of more reliable data, derived from direct information, and are:

Gold	ounces	56,255.6
Value		$1,162,906

The counties from which hydraulic-mine returns were received are Deer Lodge, Meagher, Beaver Head, and Lewis and Clarke, the relative amount of production reported from each standing in the order in which they are named above.

The ores of Montana, like those of Colorado, contain considerable amounts of copper and lead, which cannot be neglected in considering its production of metals. The table below gives the amounts which could be traced, a portion of the copper having been reduced to copper oxide in Colorado. The figures below are for crude bullion which was not reduced to the metallic state within the territory. A certain amount of copper ore was shipped directly east from Montana, but its value or contents could not be ascertained.

TABLE CLXI.—MONTANA—CRUDE BULLION PRODUCED FOR THE YEAR ENDING MAY 31, 1880.

County.	Gross tons.	Lead.		Copper.		Gold.		Silver.		Total.
		Tons.	Dollars.	Tons.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.
Beaver Head	1,568	1,132.5	101,925	186.25	74,500	.....	.....	562,574	727,352	903,777
Deer Lodge	525	.....	.....	420.00	168,000	343.5	7,101	160,300	207,252	382,353
Jefferson	83	81.5	7,335	.....	.....	332.0	6,863	30,378	39,276	53,474
Total	2,176	1,214.0	109,260	606.25	242,500	675.5	13,964	753,252	973,880	1,339,604

Lead, $90 per ton. Copper, $400 per ton.

NEW MEXICO.

Although during the census year the mines of New Mexico were attracting much attention, their practical development was awaiting the completion of the railroads which were about to intersect it. Its mining districts were many of them difficult and even dangerous of access, and it was almost impossible to ascertain in advance whether they had actually producing mines. The collection of statistics under these circumstances was peculiarly difficult, and the completeness of the material obtained was seriously impaired by the assassination of Colonel Charles Potter, the expert in charge of this territory. The data presented below do not necessarily give a fair idea of the capabilities of the territory as a mineral producer. It is believed, however, that the amount of ore produced during the census year and not accounted for below is not of very great amount.

The subjoined tables give the production of the deep mines by districts and by counties:

TABLE CLXII.—NEW MEXICO—PRODUCTION OF DEEP MINES FOR THE YEAR ENDING MAY 31, 1880.

County and district.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.		
		Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
	Tons.	Dolls.	Dolls.	Dolls.	Ounces.	Dolls.	Ounces.	Dollars.	Dollars.	Tons.	Dolls.	Dolls.	Dolls.
DOÑA AÑA.													
Hillsborough	718.5	82 65	.....	82 65	2,872.8	59,386	.....	.....	59,386	718.5	49 59	.....	49 59
Total	718.5	82 65	.....	82 65	2,872.8	59,386	.....	.....	59,386	718.5	49 59	.....	49 59
GRANT.													
Chloride Flat	4,550.0	.....	53 14	53 14	.....	.....	187,000	241,772	241,772	3,000.0	.....	29 31	29 31
Lone Mountain	1,000.0	.....	45 25	45 25	.....	.....	35,000	45,252	45,252	1,000.0	.....	31 90	31 90
Miembres	1,658.0	.....	174 93	174 93	.....	.....	224,327	290,032	290,032	1,658.0	.....	148 68	148 68
Pinos Altos	860.0	29 45	31 93	61 38	1,225.0	25,323	21,240	27,461	52,784	860.0	15 96	.....	15 96
Silver Flat	1,600.0	.....	104 24	104 24	.....	.....	129,000	166,784	166,784	216.0	.....	120 37	120 37
Total	9,668.0	2 62	70 78	82 40	1,225.0	25,323	596,567	771,301	796,624	6,734.0	2 04	58 26	60 30
SANTA FÉ.													
Los Cerrillos	100.0	20 67	32 32	52 99	100.0	2,067	2,500	3,232	5,299	.....	.....	.....	.....
Total	100.0	20 67	32 33	52 99	100.0	2,067	2,500	3,232	5,299	.....	.....	.....	.....

County and district.	Bullion produced from ore raised and treated during census year.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.				
	Gold.		Silver.		Total.		Gold.		Silver.		Total.
	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Ozs.	Dollars.	Ounces.	Dollars.	Dollars.
DOÑA AÑA.											
Hillsborough	1,723.7	35,632	.....	.....	35,632	.....	.....	.....	.....	.....	.....
Total	1,723.7	35,632	.....	.....	35,632	.....	.....	.....	.....	.....	.....
GRANT.											
Chloride Flat	.....	.....	68,000	87,917	87,917	1,550	.....	.....	67,000	86,624	86,624
Lone Mountain	.....	.....	24,675	31,903	31,903	.....	.....	.....	.....	.....	.....
Miembres	.....	.....	190,070	246,517	246,517	.....	.....	.....	.....	.....	.....
Pinos Altos	663.8	13,722	.....	.....	13,722	.....	.....	.....	.....	.....	.....
Silver Flat	.....	.....	20,110	26,000	26,000	1,384	.....	.....	111,288	143,885	143,885
Total	663.8	13,722	303,455	392,337	406,059	2,934	.....	.....	178,288	230,509	230,509
SANTA FÉ.											
Los Cerrillos	.....	.....	.....	.....	.....	100	100	2,067	2,500	3,232	5,299
Total	.....	.....	.....	.....	.....	100	100	2,067	2,500	3,232	5,299

TABLE CLXIII.—NEW MEXICO—RECAPITULATION BY COUNTIES OF PRODUCTION OF DEEP MINES FOR THE YEAR ENDING MAY 31, 1880.

County.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.		
		Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
	Tons.	Dolls.	Dolls.	Dolls.	Ounces.	Dolls.	Ounces.	Dollars.	Dollars.	Tons.	Dolls.	Dolls.	Dolls.
Doña Ana	718.5	82 65	.....	82 65	2,872.8	59,386	.....	.....	59,386	718.5	49 50	.....	49 50
Grant	9,668.0	2 62	79 78	82 40	1,225.0	25,323	596,567	771,301	796,624	6,734.0	2 04	58 20	60 30
Santa Fé	100.0	20 67	32 32	52 99	100.0	2,067	2,500	3,232	5,299	.....	.....	.....	.....
	10,486.5	8 28	73 86	82 14	4,197.8	86,776	599,067	774,533	861,309	7,452.5	0 62	52 65	50 27

County.	Bullion produced from ore raised during census year.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.				
	Gold.		Silver.		Total.		Gold.		Silver.		Total.
	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.
Doña Ana	1,723.7	35,632	.....	.....	35,632	.....	.....	.....	.....	.....	.....
Grant	663.8	13,722	303,455	392,337	406,059	2,934	.....	.....	178,288	230,509	230,509
Santa Fé	.....	.....	.....	.....	.....	100	100	2,067	2,500	3,232	5,299
	2,387.5	49,354	303,455	392,337	441,691	3,034	100	2,067	180,788	233,741	235,808

PLACER MINES.

Considerable rich placer ground is known to exist in New Mexico, but as yet but little gold has been obtained from it, owing to want of water. No record could be obtained of any product from such workings during the census year.

WYOMING.

Wyoming is surrounded on three sides by important mining regions, but has as yet developed but few mines within its borders. During the census year, as far as could be ascertained, the actual production of gold and silver has been confined to Sweetwater county, of which the production is given below:

TABLE CLXIV.—WYOMING—PRODUCTION OF DEEP MINES FOR THE YEAR ENDING MAY 31, 1880.

County and district.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.			Bullion produced from ore raised and treated during census year.				
		Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.
	Tons.	Dolls.	Dolls.	Dolls.	Ozs.	Dolls.	Ozs.	Dolls.	Dolls.	Tons.	Dolls.	Dolls.	Dolls.	Ozs.	Dolls.	Ozs.	Dolls.	Dolls.
SWEETWATER.																		
California	145	*7 00	.....	*7 00	*49.1	*1,015	.....	.....	*1,015	145	5 14	.....	5 14	36.1	746	.....	.....	746
Miners' Delight	500	*33 33	.....	*33 33	*806.2	*16,666	.....	.....	*16,666	500	25 00	.....	25 00	604.7	12,500	.....	.....	12,500
Scattered	*198	*27 44	.....	*27 44	*262.8	*5,432	.....	.....	*5,432	*198	*20 58	.....	*20 58	197.1	4,075	.....	.....	4,075
Total	843	*27 42	.....	*27 42	*1,118.1	*23,113	.....	.....	*23,113	843	20 55	.....	20 55	837.9	17,321	.....	.....	17,321

*Estimated.

TABLE CLXV.—WYOMING—RECAPITULATION OF PRODUCTION OF DEEP MINES FOR THE YEAR ENDING MAY 31, 1880.

County.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.			Bullion produced from ore raised and treated during census year.				
		Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.
	Tons.	Dolls.	Dolls.	Dolls.	Ozs.	Dolls.	Ozs.	Dolls.	Dolls.	Tons.	Dolls.	Dolls.	Dolls.	Ozs.	Dolls.	Ozs.	Dolls.	Dolls.
Sweetwater	843	*27 42	.....	*27 42	1,118.1	*23,113	.....	.....	*23,113	843	20 55	.....	20 55	837.9	17,321	.....	.....	17,321
Total	843	27 42	.....	27 42	*1,118.1	*23,113	.....	.....	*23,113	843	20 55	.....	20 55	837.9	17,321	.....	.....	17,321

*Estimated.

STATISTICS OF THE EASTERN DIVISION.

The following tables, which are grouped together without comment, are compiled from schedule data furnished by Prof. Raphael Pumpelly, together with such information as could be gathered from other sources than the direct census investigation. Some unavoidable gaps occur in the tables, arising chiefly from the uncertainty regarding assay values to be expected where mining is conducted on the small scale. The estimates for Michigan and for Tennessee are not included in this exhibit, as they are derived exclusively from non-census material.

TABLE CLXVI.—EASTERN DIVISION—PRODUCTION OF DEEP

ALABAMA.

	County and district.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.		
			Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
		Tons.	Dolls.	Dolls.	Dolls.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Dolls.	Dolls.	Dolls.
	CLEBURNE.													
1	Scattered	100									100	10 00		10 00
	Total	100									100	10 00		10 00
	TALLADEGA.													
1	Township 19, range 6	24									24	12 50		12 50
	Total	24									24	12 50		12 50

GEORGIA.

	CHEROKEE.													
1	Hickory Flat	142	22 00		22 00	151.1	3,124			3,124	85	20 00		20 00
2	Third and second	120									120	5 00		5 00
	Total	262	22 00		22 00	151.1	3,124			3,124	205	11 22		11 22
	COBB.													
1	Scattered	100									100	4 00		4 00
	Total	100									100	4 00		4 00
	FORSYTH.													
1	Third and first	40									40	5 08		5 08
	Total	40									40	5 08		5 08
	HALL.													
1	Ninth	150									150	10 00		10 00
	Total	150									150	10 00		10 00
	LINCOLN.													
1	Scattered	550									550	10 88		10 88
	Total	550									550	10 88		10 88
	M'DUFFIE.													
1	Republican	100									100	6 00		6 00
	Total	100									100	6 00		6 00
	MERIWETHER.													
1	Lutherville	1,590									1,590	2 00		2 00
	Total	1,590									1,590	2 00		2 00

MAINE.

	HANCOCK.													
1	Goldsboro	100									100	30 00		30 00
2	West Sullivan	1,700	Traces.	30 00	30 00			39,446	51,000	51,000	300	Traces.	24 00	24 00
	Total	1,800	Traces.	30 00	30 00			39,446	51,000	51,000	400	7 50	18 00	25 50
	PENOBSCOT.													
1	Carmel	400	26 87	5 17	32 04	519.9	10,747	1,599	2,067	12,814				
	Total	400	26 87	5 17	32 04	519.9	10,747	1,599	2,067	12,814				
	YORK.													
1	Acton	50	6 75	32 30	39 05	16.3	337	1,249	1,615	1,952				
	Total	50	6 75	32 30	39 05	16.3	337	1,249	1,615	1,952				

MINES FOR THE YEAR ENDING MAY 31, 1880.

ALABAMA.

Bullion produced from ore raised and treated during census year.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.					
Gold.		Silver.		Total.		Gold.		Silver.		Total.	
Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	
48.4	1,001			1,001							1
48.4	1,001			1,001							
14.5	300			300							1
14.5	300			300							

GEORGIA.

82.3	1,701			1,701	57	60.7	1,255			1,255	1
29.0	600			600							2
111.3	2,301			2,301	57	60.7	1,255			1,255	
19.3	399			399							1
19.3	399			399							
9.8	203			203							1
9.8	203			203							
72.6	1,501			1,501							1
72.6	1,501			1,501							
289.5	5,984			5,984							1
289.5	5,984			5,984							
29.0	599			599							1
29.0	599			599							
153.8	3,179			3,179							1
153.8	3,179			3,179							

MAINE.

145.1	2,999			2,999							1
		5,569	7,200	7,200	1,400			32,486	42,001	42,001	2
145.1	2,999	5,569	7,200	10,199	1,400			32,486	42,001	42,001	
					400	519.9	10,747	1,599	2,067	12,814	1
					400	519.9	10,747	1,599	2,067	12,814	
					50	16.3	337	1,249	1,615	1,952	1
					50	16.3	337	1,249	1,615	1,952	

TABLE CLXVI.—EASTERN DIVISION—PRODUCTION OF DEEP

NEW HAMPSHIRE.

	County and district.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.		
			Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
		Tons.	Dolls.	Dolls.	Dolls.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Dolls.	Dolls.	Dolls.
	GRAFTON.													
1	Ammonoosuc	2,183									2,183	5 04	7 32	12 36
	Total	2,183									2,183	5 04	7 32	12 36

NORTH CAROLINA.

	DAVIDSON.													
1	Emmons township	20,000	17 50	2 50	20 00	16,931.2	*349,999	38,673	*50,000	*399,999				
2	Thomasville township	200									200	10 00		10 00
	Total	20,200	17 50	2 50	20 00	16,931.2	*349,999	38,673	*50,000	*399,999	200	10 00		10 00
	GASTON.													
1	Scattered	1,821									1,821	5 00		5 00
	Total	1,821									1,821	5 00		5 00
	GUILFORD.													
1	Scattered	10									10	2 87		2 87
	Total	10									10	2 87		2 87
	MECKLENBURG.													
1	Capp's Hill	450									450	65 00		65 00
2	Sixth district	10,920									10,920	6 00		6 00
	Total	11,370									11,370	8 33		8 33
	MOORE.													
1	Scattered	625									625	7 84	0 16	8 00
	Total	625									625	7 84	0 16	8 00
	NASH.													
1	Griffith township	60									60	20 07		20 07
	Total	60									60	20 07		20 07
	ROWAN.													
1	Scattered	1,200	9 00	3 00	12 00	522.4	10,799	2,784	3,599	14,398				
	Total	1,200	9 00	3 00	12 00	522.4	10,799	2,784	3,599	14,398				
	STANLEY.													
1	Scattered	500									500	4 00		4 00
	Total	500									500	4 00		4 00

SOUTH CAROLINA.

	ABBEVILLE.													
1	Bordeaux township													
	Total													
	COLLETON.													
1	Scattered													
	Total													

VIRGINIA.

	BUCKINGHAM.													
1	Curdsville	74									74	5 00		5 00
	Total	74									74	5 00		5 00
	CULPEPER.													
1	Scattered	90	40 09	1 40	41 49	174.5	3,607	97	125	3,732	5	35 80		35 80
	Total	90	40 09	1 40	41 49	174.5	3,607	97	125	3,732	5	35 80		35 80
	Additional production shown by mint receipts (a)													

* Estimated.

a Receipts of Virginia gold at Philadelphia mint and New York assay office were $9,322.

MINES FOR THE YEAR ENDING MAY 31, 1880—Continued.

NEW HAMPSHIRE.

Bullion produced from ore raised and treated during census year.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.					
Gold.		Silver.		Total.		Gold.		Silver.		Total.	
Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	
532.1	10,999	12,375	16,000	26,999							1
532.1	10,999	12,375	16,000	26,999							

NORTH CAROLINA.

					20,000	16,931.2	*349,999	38,673	*50,000	*399,999	1
96.8	2,001			2,001							
96.8	2,001			2,001	20,000	16,931.2	*349,999	38,673	*50,000	*399,999	
440.5	9,106			9,106							1
440.5	9,106			9,106							
13.9	287			287							1
13.9	287			287							
1,415.0	29,251			29,251							1
3,169.5	65,519			65,519							2
4,584.5	94,770			94,770							
237.0	4,899	77	100	4,999							1
237.0	4,899	77	100	4,999							
58.2	1,203			1,203							1
58.2	1,203			1,203							
					1,200	522.4	10,799	2,784	3,599	14,398	1
					1,200	522.4	10,799	2,784	3,599	14,398	
96.8	2,001			2,001							1
96.8	2,001			2,001							

SOUTH CAROLINA.

24.2	500			500							1
24.2	500			500							
290.2	5,999			5,999							1
290.2	5,999			5,999							

VIRGINIA.

17.9	370			370							1
17.9	370			370							
8.7	180			180	35	164.8	3,407	94	122	3,529	1
8.7	180			180	35	164.8	3,407	94	122	3,529	
424.3	8,771			8,771							

TABLE CLXVII.—EASTERN DIVISION—RECAPITULATION BY STATES AND COUNTIES

	State and county.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.		
			Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
		Tons.	Dolls.	Dolls.	Dolls.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Dolls.	Dolls.	Dolls.
	ALABAMA.													
1	Cleburne (a)	100									100	10 00		10 00
2	Talladega (a)	24									24	12 50		12 50
	Total	124									124	10 50		10 50
	GEORGIA.													
1	Cherokee (a)	262	22 00		22 00	151.1	3,124			3,124	205	11 22		11 22
2	Cobb	100									100	4 00		4 00
3	Forsyth	40									40	5 08		5 08
4	Hall	150									150	10 00		10 00
5	Lincoln	550									550	10 88		10 88
6	McDuffie	100									100	6 00		6 00
7	Meriwether	1,590									1,590	2 00		2 00
	Total	2,792				151.1	3,124			3,124	2,735	5 18		5 18
	MAINE.													
1	Hancock (a)	1,800		30 00	30 00			39,446	51,000	51,000	400	7 50	18 00	25 50
2	Penobscot	400	26 87	5 17	32 04	519.9	10,747	1,599	2,067	12,814				
3	York	50	6 75	32 30	39 05	16.3	337	1,240	1,615	1,952				
	Total	2,250				536.2	11,084	42,294	54,682	65,766	400	7 50	18 00	25 50
	NEW HAMPSHIRE.													
1	Grafton	2,183									2,183	5 04	7 32	12 36
	NORTH CAROLINA.													
1	Davidson	20,200	17 50	2 50	20 00	16,931.2	*349,999	38,673	*50,000	*399,999	200	10 00		10 00
2	Gaston	1,821									1,821	5 00		5 00
3	Guilford	10									10	2 87		2 87
4	Mecklenburg	11,370									11,370	8 33		8 33
5	Moore	625									625	7 84	0 16	8 00
6	Nash	60									60	20 07		20 07
7	Rowan	1,200	9 00	3 00	12 00	522.4	10,799	2,784	3,599	14,398				
8	Stanley	500									500	4 00		4 00
	Total	35,786				17,453.6	360,798	41,457	53,599	414,397	14,586	7 83		7 83
	SOUTH CAROLINA.													
1	Abbeville													
2	Colleton													
	Total													
	VIRGINIA.													
1	Buckingham	74									74	5 00		5 00
2	Culpeper	90	40 09	1 40	41 49	174.5	3,607	97	125	3,732	5	35 80		35 80
	Total from schedule data	164									79	6 96		6 96
	Additional production shown by mint receipts													
	Total	164				174.5	3,607	97	125	3,732				

*Estimated. a No assay values given.

OF PRODUCTION OF DEEP MINES FOR THE YEAR ENDING MAY 31, 1880.

Bullion produced from ore raised and treated during census year.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.					
Gold.		Silver.		Total.		Gold.		Silver.		Total.	
Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	
48.4	1,001			1,001							1
14.5	300			300							2
62.9	1,301			1,301							
111.3	2,301			2,301	57	60.7	1,255			1,255	1
19.3	399			399							2
9.8	203			203							3
72.6	1,501			1,501							4
280.5	5,984			5,984							5
29.0	599			599							6
153.8	3,179			3,179							7
685.3	14,166			14,166	57	60.7	1,255			1,255	
145.1	2,999	5,569	7,200	10,199	1,400			32,486	42,001	42,001	1
					400	519.9	10,747	1,599	2,067	12,814	2
					50	16.3	337	1,249	1,615	1,952	3
145.1	2,999	5,569	7,200	10,199	1,850	536.2	11,084	35,334	45,683	56,767	
532.1	10,999	12,375	16,000	26,999							1
96.8	2,001			2,001	20,000	16,931.2	*349,999	38,673	*50,000	*399,999	1
440.5	9,106			9,106							2
13.9	287			287							3
4,584.5	94,770			94,770							4
237.0	4,899	77	100	4,999							5
58.2	1,203			1,203							6
					1,200	522.4	10,799	2,784	3,599	14,398	7
96.8	2,001			2,001							8
5,527.7	114,267	77	100	114,367	21,200	17,453.6	*360,798	41,457	*53,599	414,397	
24.2	500			500							1
290.2	5,999			5,999							2
314.4	6,499			6,499							
17.9	370			370							1
8.7	180			180	85	164.8	3,407	94	122	3,529	2
26.6	550			550	85	164.8	3,407	94	122	3,529	
424.3	8,771			8,771							
450.9	9,321			9,321	85	164.8	3,407	94	122	3,529	

*Estimated.

TABLE CLXVIII.—EASTERN DIVISION—PRODUCTION OF HYDRAULIC, PLACER, RIVER, AND BRANCH MINES FOR THE YEAR ENDING MAY 31, 1880.

GEORGIA.

County.	District.	Gold.			
		Totals by districts.		Totals by counties.	
		Ounces.	Dollars.	Ounces.	Dollars.
Cherokee	Fifteenth and second	10.9	225	10.9	225
Hall	810 G. M., 9 and 12 L	183.2	3,787	183.2	3,787
Lumpkin	Twelfth	1,591.6	32,901	2,838.3	58,673
Do	Twelfth and first	1,237.9	25,590		
Do	Thirteenth	8.8	182		
Union	Tenth	72.6	1,501	72.6	1,501
White	Third	81.1	1,676	129.5	2,677
Do	Fourth	48.4	1,001		
Total		3,234.5	66,863	3,234.5	66,863

NORTH CAROLINA.

Montgomery	El Dorado	34.9	721	207.6	4,294
Do	Scattered	172.7	3,570		
Pope	Scattered	19.1	395	19.1	395
Total		226.7	4,686	226.7	4,686

SOUTH CAROLINA.

Chesterfield	Scattered	316.4	6,541	316.4	6,541
Total		316.4	6,541	316.4	6,541

SILVER CONTAINED IN PLACER GOLD.

No account is taken by the miners of the silver alloyed with placer gold, unless in the exceptional cases where the value of the former is allowed for in the sale of the product, as in direct sales to the mints or United States assay offices. In the aggregate this silver forms a considerable item, which should be included in the total product, but which has usually been disregarded by statisticians.

The schedules of the experts contain data for a close estimate as to the average tenor of the placer product. A statement of the fineness in gold of samples from various localities is appended.

TABLE CLXIX.—SPECIMEN EXAMPLES OF PLACER GOLD.

CALIFORNIA.

County and locality.	Fineness in gold.	Remarks.
BUTTE.		
Centerville	0.900	
Cherokee Flat	0.970	
Magalia	0.900	
Morris Ravine	0.905—0.908	
Oroville	0.942	
CALAVERAS.		
Mokelumne Hill	0.850—0.960	
DEL NORTE.		
Bunker Hill Mine	0.887—0.925	
China Creek	0.900	
Happy Camp	0.875—0.935	
Indian Creek	0.900	
Wingate Mine	0.944—0.950	
EL DORADO.		
Placerville	0.980	
HUMBOLDT.		
Gold Bluffs	0.940	
Orleans Bar	0.726	Sold for $13 to $17 per ounce.
PLACER.		
Bath	0.850	
Dutch Flat	0.900—0.910	
Gold Run	0.900	
Iowa Hill	0.784—0.814	
Michigan Bluffs	0.925—0.960	
PLUMAS.		
Black Hawk Mine	0.924	
Cook's Cañon	0.885	
Gopher Hill	0.936	
Hungarian Hill	0.924	
Seneca	0.846	
SHASTA.		
Igo	0.885	

TABLE CLXIX.—SPECIMEN EXAMPLES OF PLACER GOLD—Continued.

CALIFORNIA—Continued.

County and locality.	Fineness in gold.	Remarks.
SISKIYOU.		
Callahan's Ranch	0.859	Sold for $17 75 per ounce.
Cottonwood	0.860	
Coyote Gulch	0.900—0.950	
Galena Hill	0.880—0.930	
Greenhorn	0.850	
Humbug Creek	0.809—0.865	
Indian Creek	0.835—0.900	Sold for $17 per ounce.
McAdams Creek	0.750—0.900	
Oro Fino	0.762	
Rattlesnake Creek	0.827	Sold for $16 50 per ounce.
Sawyer's Bar	0.850	
Sciad Valley	0.887—0.912	
Scott Valley	0.805	Sold for $16 to $16 25 per ounce.
South Fork Salmon	0.835	Sold for $16 75 per ounce.
Yreka	0.749—0.863	Sold for $15 to $17 12 per ounce.
STANISLAUS.		
La Grange	0.920	
TRINITY.		
Buckeye	0.890—0.900	
Cañon Creek	0.894—0.896	
Chapman's and Fisher's Mines	0.914—0.917	
Douglas	6.912	
Indian Creek	0.920	
Junction City	0.875—0.915	Sold for $18 per ounce.
Red Hill	0.910—0.917	
Trinity Center	0.900	
Trinity Mine	0.887—0.903	
Weaver	0.906—0.927	

COLORADO.

CHAFFEE.		
Hope	0.850	
CLEAR CREEK.		
Jackson	0.880	
LAKE.		
California	0.850—0.875	
PARK.		
Alma township	0.819	
ROUTT.		
Hahn's Peak	0.666	
SUMMIT.		
Bevan	0.750—0.820	
Spalding	0.850—0.900	

DAKOTA.

LAWRENCE.		
Bear Gulch	0.940	
Cape Horn	0.870	
PENNINGTON.		
Cañon	0.925	
Confederate	0.925—0.940	
Jenny and Strawberry	0.940	

GEORGIA.

CHEROKEE.		
Fifteenth District	0.927	Sold for $19 20 per ounce.
HALL.		
810 G. M. 9th and 12th districts	0.900—0.916	
LUMPKIN.		
Twelfth District	0.875—0.995	
Thirteenth District	0.962—0.992	
WHITE.		
Fourth District	0.945	
UNION.		
Tenth District	0.981	

IDAHO.

BOISÉ.		
Boisé Basin and vicinity	0.7806	Average of 413 lots.

MONTANA.

BEAVER HEAD.		
Bannock	0.935	
DEER LODGE.		
Gold Hill	0.950—0.956	
Henderson Gulch	0.925—0.957	
Independence	0.725—0.730	
McClellan's Gulch	0.860—0.930	Sold for $17 50 per ounce.
DEER LODGE—continued.		
Nelson	0.935—0.940	
Summit Valley	0.700	
LEWIS AND CLARKE.		
Last Chance	0.910	
MEAGHER.		
German	0.830—0.835	
Thompson's Gulch	0.945—0.980	

TABLE CLXIX.—SPECIMEN EXAMPLES OF PLACER GOLD—Continued.

OREGON.

BAKER.		
Amelia	0.810—0.900	
Blue Cañon	0.840—0.853	Sold for $16 50 per ounce.
Chicken Creek	0.725	Sold for $15 per ounce.
Humboldt Basin	0.789—0.866	Do. Do.
Mormon Basin	0.750	Sold for $16 per ounce.
Pocahontas	0.782—0.851	Sold for $15 50 to $17 per ounce.
Rye Valley	0.756	
Shasta	0.850—0.860	Sold for $16 50 per ounce.
Willow Creek	0.825	
CURRY.		
Sixes River	0.825	Sold for $17 per ounce.
DOUGLAS.		
Big Bend	0.925—0.950	Sold for $17 per ounce.
Cañonville	0.900—0.956	
Green Mountain	0.825—0.830	
GRANT.		
Cañon City	0.850—0.900	Sold for $17 60 per ounce.
Granite	0.750—0.761	
Marysville	0.805—0.887	Sold for $16 25 to $17 60 per ounce.
Rock Creek	0.857	Sold for $16 50 to $16 75 per ounce.
Trail Creek	0.850	
JACKSON.		
Applegate	0.850	
Ashland	0.846	
Coyote Creek	0.895—0.930	
JACKSON—continued.		
Dry Diggings	0.975	
Fort Lane	0.870	Sold for $16 25 per ounce.
Forty-Nine	0.837	Sold for $16 50 per ounce.
Grass Creek	0.875—0.900	
Jackass Creek	0.950	
Jacksonville	0.860	
Sam's Valley	0.825	
Sardine Creek	0.810—0.900	Sold for $16 75 per ounce.
Sterling	0.826—0.908	
Uniontown	0.804—0.820	Sold for $16 75 per ounce.
Wolf Creek	0.925	
JOSEPHINE.		
Althouse	0.865—0.875	Sold for $16 50 per ounce.
Cañon Creek	0.900	Sold for $17 per ounce.
Grass Creek	0.900—0.930	
Illinois	0.900	
Josephine	0.900	
Murphy	0.900	
Silver Creek	0.900	
Waldo	0.910—0.927	
Yank	0.967	
UMATILLA.		
Columbia River	0.740	Sold for $15 30 per ounce.
WASCO.		
Ochoco	0.711	

From the same sources the following condensed abstract has been prepared, showing the average fineness in gold and silver of the placer yield of several states and territories, with the number of specimen examples from which these averages are derived. The amount of base metal contained in the crude bullion varies from nothing to 0.020.

TABLE CLXX.—AVERAGE TENOR OF PLACER GOLD.

State or territory.	Number of examples.	Average fineness.	
		Gold.	Silver.
California	80	0.8836	0.1124
Colorado	9	0.8205	0.1755
Dakota	7	0.9235	0.0725
Georgia	10	0.9228	0.0732
Idaho	413	0.7806	0.2194
Montana	14	0.8951	0.1009
Oregon	77	0.8727	0.1393
Total	610		

From eighty examples of California placer dust and bullion an average fineness of 0.8836 is derived, a proportion slightly in excess of that stated in Dana's *Mineralogy*, where the fineness is quoted at 0.875 to 0.885, or an average of 0.880. It is possible that the census average is a trifle too high, owing to the natural tendency of producers to overestimate the fineness of their gold; but the slight difference between it and the figures given by Dana would not materially affect the general result.

The average for Idaho is of 413 lots of placer gold from Boisé basin, a district producing three-fourths of the total for the territory. This gold is of less fineness than that obtained in several other localities in Idaho, but the average stated will hold as a close approximation for the total.

There are three methods of obtaining from these data an average for the United States—neither of which is quite free from defects.

If the sum of the figures representing the average gold fineness for the several states and territories be divided by seven, the number of the states and territories from which reliable data as to fineness are obtainable, the quotient is 0.871257, which may be described as an average of geographical distribution. This, however, does not represent the average fineness of the whole actual amount produced, for by this method each state and territory is taken as an equal member in the calculation, without regard to the large difference in their several products. Thus, Georgia, with a product of $66,863, has as much weight in influencing the general average as California with a placer yield of $8,580,989, or 128 times as large.

Another mode is to give each individual example equal weight, disregarding territorial limits. Dividing the sum of fineness in gold of 610 specimen examples, 495,887, by 610, an average of 0.8129 is obtained. This gives a true average for the number of cases in which the fineness is definitely given in the schedules, but represents neither the average according to geographical distribution nor that of the whole product. In this way California, with a placer product nine and three-fourths times greater than that of Idaho, is largely overweighted by the latter, owing to the preponderance of examples furnished by Idaho in the census returns. The result is evidently too low.

The third and preferable method is to multiply the average fineness for each state and territory by the coefficient of the several yields, and then divide the sum of the products so obtained by the sum of the coefficients. This gives each not an equal but a just weight. The result is the average fineness of the total product without reference to the producing source. This principle is thus applied:

State or territory.	Average fineness in gold.		Yield of placer gold in millions of dollars.		Resultants.
California	0.8836	×	8.581	=	7.5821716
Colorado	0.8205	×	0.102	=	0.0836910
Dakota	0.9235	×	0.051	=	0.0470985
Georgia	0.9228	×	0.067	=	0.0618276
Idaho	0.7806	×	0.880	=	0.6869280
Montana	0.8951	×	1.163	=	1.0410013
Oregon	0.8727	×	0.926	=	0.8081202
			11.770		10.3108382

$$\text{Total average gold fineness} = \frac{10.3108382}{11.770} = 0.87602$$

The proportionate contents in silver and in base metal are similarly ascertained. By using the figures representing the average tenor of the placer gold for each of the states and territories for which reliable data are obtainable, and assuming the general average deduced from them for the cases in which the returns are defective, the probable total silver contents may readily be calculated. It is found that the 580,766.6 ounces of fine gold were associated with 80,177.3 ounces of fine silver and 2,753.2 ounces of base metal, making the total weight of the crude placer gold 663,697.1 ounces. In mint value the silver contents were worth only $103,661 as against $12,005,511 for the gold. Thus while the ratio of silver to gold products was 1:7.2437 in weight, it was only 1:115.8153 in assay value. At the market rates the value of this placer silver, if any account were taken of it, would be considerably less, or a ratio of about 1:131. The loss to the miners in the price paid for the actual gold contents of the placer dust, when sold in small quantities to local dealers, is so much greater than the whole value of the silver contents, that the latter does not appear to them a matter of any consequence. The amount of silver alloyed with the placer gold of the several states and territories is shown in the accompanying table:

TABLE CLXXI.—CONTENTS AND MINT VALUE OF CRUDE PLACER GOLD.

State or territory.	Contents of placer gold.				Mint value.		
	Fine gold.	Fine silver.	Base metal.	Total crude metal.	Gold.	Silver.	Total.
	Ounces.	Ounces.	Ounces.	Ounces.	Dollars.	Dollars.	Dollars.
Alaska	287.0	*39.4	1.3	328.6	5,951	*51	6,002
Arizona	*1,451.2	*198.8	*6.6	*1,656.6	*29,999	*257	*30,256
California	415,105.0	52,804.2	1,879.1	469,788.3	8,580,982	68,271	8,649,253
Colorado	4,921.9	1,052.8	24.6	5,998.6	101,745	1,361	103,106
Dakota	2,460.3	193.1	0.2	2,653.6	50,859	250	51,109
Georgia	3,234.5	256.6	14.0	3,505.1	66,863	332	67,195
Idaho	42,552.3	11,633.1	327.1	54,512.9	879,644	15,040	894,684
Montana	56,255.6	6,341.4	251.4	62,848.4	1,162,906	8,199	1,171,105
Nevada	*2,418.7	*331.3	*11.0	*2,761.1	*49,999	*428	*50,427
North Carolina	*226.7	*31.0	*1.0	*258.8	*4,686	*40	*4,726
Oregon	44,811.5	6,331.2	205.4	51,348.1	926,336	8,186	934,522
South Carolina	316.4	*43.3	*1.4	*361.2	6,541	*56	*6,597
Utah	967.5	*132.5	*4.4	*1,104.4	20,000	*171	*20,171
Washington	5,756.6	*788.6	*26.3	*6,571.4	119,000	*1,019	*120,019
Total	580,766.6	80,177.3	2,753.2	663,697.1	12,005,511	103,661	12,109,172

*Estimated.

RÉSUMÉ OF PRODUCTION STATISTICS.

The statements of ore raised, its average assay value per ton and total assay valuation; ore treated, of that which was raised during the year, its average yield per ton and total bullion product; ore which remained on the dumps at the close of the census year and its assay value; and bullion produced from ore raised prior to the census year, including old tailings reworked, are grouped into the following comprehensive exhibit of the deep mines:

TABLE CLXXII.—UNITED STATES—PRODUCTION OF

	State or territory.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.					Ore raised and treated.	Average yield per ton.		
			Gold.	Silver.	Gold and silver.	Gold.		Silver.		Total.		Gold.	Silver.	Gold and silver.
		Tons.	Dolls.	Dolls.	Dolls.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Dolls.	Dolls.	Dolls.
		2,216,417.61	*a*12 68	*a*25 64	*a*38 32	1,289,990.5	26,666,468	41,193,494	53,259,070	79,925,538	1,884,426.25	*a*10 38	*a*20 43	*a*30 81
1	Alabama (*b*)	124.00									124.00	10 50		10 50
2	Alaska													
3	Arizona	48,252.50	*8 70	*89 19	*97 89	*20,312.3	*419,802	*3,328,753	*4,303,746	*4,723,638	*25,798.25	*7 01	*88 24	*93 25
4	Arkansas													
5	California	544,241.00	18 84	2 84	21 08	495,962.1	10,252,446	1,194,084	1,543,832	11,796,278	435,301.00	16 10	2 00	18 10
6	Colorado	356,360.60	8 58	55 26	63 94	149,548.2	3,091,445	15,233,414	19,695,282	22,786,717	330,580.50	6 80	49 20	56 00
7	Connecticut													
8	Dakota	536,748.00	7 71	33	8 04	200,313.9	4,140,856	136,853	176,937	4,317,793	496,130.00	6 33	14	6 47
9	Delaware													
10	District of Columbia													
11	Florida													
12	Georgia (*b*)	2,792.00				151.1	3,124			3,124	2,735.00	5 18		5 18
13	Idaho	35,825.50	28 97	24 52	53 49	50,212.4	1,037,982	679,387	878,379	1,916,361	28,029.75	21 16	15 91	37 07
14	Illinois													
15	Indiana													
16	Indian Territory													
17	Iowa													
18	Kansas													
19	Kentucky													
20	Louisiana													
21	Maine (*b*)	2,250.00				536.2	11,084	42,294	54,682	65,766	400.00	7 50	18 00	25 50
22	Maryland													
23	Massachusetts													
24	Michigan (*c*)													
25	Minnesota													
26	Mississippi													
27	Missouri													
28	Montana	114,858.00	9 95	42 68	52 63	55,286.7	1,142,878	3,791,502	4,902,034	6,044,912	80,576.50	7 30	32 52	39 82
29	Nebraska													
30	Nevada	356,052.33	15 62	41 06	56 68	269,077.4	5,562,323	11,308,738	14,621,067	20,183,390	346,331.00	12 35	33 47	45 82
31	New Hampshire (*b*)	2,183.00									2,183.00	5 04	7 32	12 36
32	New Jersey													
33	New Mexico	10,486.50	8 28	73 86	82 14	4,197.8	86,776	599,067	774,533	861,309	7,452.50	6 62	52 65	59 27
34	New York													
35	North Carolina (*b*)	35,786.00				17,453.6	360,798	41,457	53,599	414,397	14,586.00	7 83	Trace.	7 83
36	Ohio													
37	Oregon	14,087.00	16 86	5 35	22 21	11,491.7	237,555	58,292	75,360	312,921	13,772.00	12 41	1 30	13 74
38	Pennsylvania													
39	Rhode Island													
40	South Carolina (*b*)													
41	Tennessee													
42	Texas													
43	Utah	154,827.78	1 75	39 91	41 66	13,088.5	270,563	4,779,556	6,179,488	6,450,051	93,116.75	1 98	31 38	33 36
44	Vermont													
45	Virginia (*b*)	164.00				174.5	3,607	97	125	3,732				
46	Washington	537.00	41 04	Trace.	41 04	1,066.0	22,036			22,036	537.00	31 28	Trace.	31 28
47	West Virginia													
48	Wisconsin													
49	Wyoming	843.00	*27 42		*27 42	1,118.1	23,113			23,113	843.00	20 55		20 55

* Estimated.
a Average calculated without including partial data from eastern and southern states.
b No further schedule data.

DEEP MINES FOR THE YEAR ENDING MAY 31, 1880.

Bullion produced from ore raised and treated during census year.					Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.					Bullion produced during census year from ore previously raised.					
Gold.		Silver.		Total.		Gold.		Silver.		Total.	Gold.		Silver.		Total.	
Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Tons.	Ozs.	Dollars.	Ounces.	Dollars.	Dollars.	Ozs.	Dollars.	Ounces.	Dollars.	Dollars.	
972,582.9	20,105,073	30,577,025	39,533,037	59,638,110	182,346.00	89,033.8	1,840,493	5,277,522	6,823,308	8,663,801	61,301.7	1,269,079	1,140,272	1,474,250	2,743,336	
62.9	1,301	.....	.....	1,301	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
*8,725.2	*180,366	*1,716,176	*2,218,844	*2,399,210	22,524.25	8,607.7	179,176	1,209,472	1,563,726	1,742,902	77.4	1,600	82,540	106,724	108,324	3
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4
402,469.5	8,319,786	828,536	1,071,215	9,391,001	8,940.00	3,814.3	78,850	7,281	9,414	88,264	12,102.2	250,173	8,818	11,401	261,574	5
110,181.3	2,277,649	12,579,551	16,264,101	18,541,750	25,779.50	6,007.9	124,194	1,631,044	2,109,553	2,233,747	15,504.4	320,504	219,516	283,812	604,316	6
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7
151,837.1	3,138,751	54,577	70,563	3,209,314	40,618.00	17,753.3	366,994	25,404	32,845	399,839	5,622.7	116,233	.....	.....	116,233	8
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11
685.3	14,166	.....	.....	14,166	57.00	69.7	1,255	.....	.....	1,255	.....	.....	.....	.....	.....	12
28,689.9	593,073	344,969	446,010	1,039,083	7,795.75	16,411.6	339,258	283,622	366,695	705,953	335.5	6,936	2,707	3,500	10,436	13
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	16
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	17
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	18
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	19
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20
145.1	2,999	5,569	7,200	10,199	1,850.00	536.2	11,084	35,334	45,683	56,767	.....	.....	.....	.....	.....	21
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	22
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	23
.....	.....	*20,000	*25,858	*25,858	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	24
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	25
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	26
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	27
30,570.4	631,946	2,177,700	2,815,627	3,447,573	28,281.50	12,801.2	265,864	860,303	1,112,285	1,378,149	528.0	10,915	62,837	81,242	92,157	28
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	29
206,907.4	4,277,156	8,964,562	11,590,282	15,867,438	9,721.00	3,954.4	81,745	462,980	598,587	680,332	27,142.6	*561,087	649,668	*839,957	*1,401,044	30
532.1	10,999	12,375	16,000	26,999	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	31
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	32
2,387.5	49,354	303,455	392,337	441,691	3,034.00	100.0	2,067	180,788	233,741	235,808	.....	.....	.....	.....	.....	33
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	34
5,527.7	114,267	77	100	114,367	21,200.00	17,453.6	*360,798	41,457	*53,599	414,397	.....	.....	.....	.....	.....	35
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	36
8,285.5	171,276	13,880	17,946	189,222	315.00	1,083.6	22,400	31,634	40,900	63,300	4.3	89	1,285	1,661	1,750	37
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	38
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	39
314.4	6,499	.....	.....	6,499	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	40
*d*96.7	*d*1,998	.....	.....	*d*1,998	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	41
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	42
13,063.4	270,045	3,555,538	4,596,954	4,866,999	12,145.00	164.5	3,401	507,509	656,158	659,559	74.6	1,542	112,895	145,962	147,504	43
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	44
*d*450.9	*d*9,321	.....	.....	*d*9,321	85.00	164.8	3,407	94	122	3,529	.....	.....	.....	.....	.....	45
812.7	16,800	.....	.....	16,800	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	46
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	47
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	48
837.9	17,321	.....	.....	17,321	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	49

* Estimated.
c Estimated from receipts at New York assay-office; does not include bullion from Silver Islet (which is in Canada).
d Actual receipts at Philadelphia mint and New York assay-office.

TABLE CLXXIII.—BULLION PRODUCT OF THE UNITED

	State or territory.	DEEP MINES.									
		From ore raised and treated during census year.					From ore raised prior to, but treated during, census year.				
		Gold.		Silver.		Total.	Gold.		Silver.		Total.
		Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.
	Total	972,582.9	20,105,073	30,577,025	39,533,037	59,638,110	61,391.7	1,269,079	1,140,272	1,474,259	2,743,338
1	Alabama	62.9	1,301			1,301					
2	Alaska										
3	Arizona	8,725.2	180,366	*1,716,176	*2,218,844	*2,399,210	77.4	1,600	82,546	106,724	108,324
4	California	402,469.5	8,319,786	828,536	1,071,215	9,391,001	12,102.2	250,173	8,818	11,401	261,574
5	Colorado	110,181.3	2,277,649	12,579,551	16,264,101	18,541,750	15,504.4	320,504	219,510	283,812	604,316
6	Dakota	151,837.1	3,138,751	54,577	70,563	3,209,314	5,622.7	116,233			116,233
7	Georgia	685.3	14,166			14,166					
8	Idaho	28,689.9	593,073	344,969	446,010	1,039,083	335.5	6,936	2,707	3,500	10,436
9	Maine	145.1	2,999	5,569	7,200	10,199					
10	Michigan			*20,000	*25,858	*25,858					
11	Montana	30,570.4	631,946	2,177,760	2,815,627	3,447,573	528.0	10,915	62,837	81,242	92,157
12	Nevada	206,907.4	4,277,156	8,964,562	11,590,282	15,867,438	27,142.6	561,087	640,668	839,057	1,401,044
13	New Hampshire	532.1	10,999	12,375	16,000	26,999					
14	New Mexico	2,387.5	49,354	303,455	392,337	441,691					
15	North Carolina	5,527.7	114,267	77	100	114,367					
16	Oregon	8,285.5	171,276	13,880	17,946	189,222	4.3	89	1,285	1,661	1,750
17	South Carolina	314.4	6,499			6,499					
18	Tennessee	96.7	1,998			1,998					
19	Utah	13,063.4	270,045	3,555,538	4,596,954	4,866,999	74.6	1,542	112,895	145,962	147,504
20	Virginia	450.9	9,321			9,321					
21	Washington	812.7	16,800			16,800					
22	Wyoming	837.9	17,321			17,321					

*Estimated.

STATES FOR THE YEAR ENDING MAY 31, 1880.

DEEP MINES—continued. Total from deep mines.					PLACER MINES.					ALL MINES.					
Gold.		Silver.		Total.	Gold.		Silver.		Total.	Gold.		Silver.		Total.	
Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	Ounces.	Dollars.	Ozs.	Dolls.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Dollars.	
1,033,974.6	21,374,152	31,717,297	41,007,296	62,381,448	580,766.6	12,005,511	80,177.3	103,661	12,109,172	1,614,741.2	33,379,663	31,797,474.3	41,110,957	74,490,620	
62.9	1,301	.....	.....	1,301	.....	.....	.....	.....	.....	62.9	1,301	.....	.....	1,301	1
.....	.....	.....	.....	.....	287.9	5,951	*39.4	*51	6,002	287.9	5,951	39.4	51	6,002	2
*8,802.6	*181,966	*1,798,722	*2,325,568	*2,507,534	*1,451.2	*29,999	*198.8	*257	*30,256	*10,253.8	*211,965	*1,798,920.8	*2,325,825	*2,537,790	3
414,571.7	8,569,959	837,854	1,082,616	9,652,575	415,105.0	8,580,082	52,804.2	68,271	8,649,253	829,676.7	17,150,041	890,158.2	1,150,887	18,301,828	4
125,685.7	2,598,153	12,709,067	16,547,913	19,146,066	4,921.9	101,745	1,052.8	1,361	103,106	130,607.6	2,699,898	12,800,119.8	16,549,274	19,249,172	5
157,459.8	3,254,984	54,577	70,563	3,325,547	2,460.3	50,850	193.1	250	51,109	159,920.1	3,305,843	54,770.1	70,813	3,376,656	6
685.3	14,166	.....	.....	14,166	3,234.5	66,803	256.6	332	67,195	3,919.8	81,029	256.6	332	81,361	7
20,025.4	600,009	347,676	449,510	1,049,519	42,552.8	879,044	11,033.1	15,040	894,684	71,578.2	1,479,053	359,209.1	464,550	1,944,203	8
145.1	2,999	5,569	7,200	10,199	.....	.....	.....	.....	.....	145.1	2,999	5,569.0	7,200	10,199	9
.....	.....	*20,000	*25,858	*25,858	.....	.....	.....	.....	.....	.....	.....	*20,000.0	*25,858	*25,858	10
31,098.4	642,861	2,240,597	2,896,869	3,539,730	56,255.6	1,162,906	6,341.4	8,199	1,171,105	87,354.0	1,805,767	2,246,938.4	2,905,068	4,710,835	11
234,050.0	4,838,243	9,614,230	12,430,239	17,268,482	*2,418.7	*49,999	*331.3	*428	*50,427	236,468.7	4,888,242	9,614,561.3	12,430,667	17,318,909	12
532.1	10,999	12,375	16,000	26,999	.....	.....	.....	.....	.....	532.1	10,999	12,375.0	16,000	26,999	13
2,387.5	49,354	303,455	392,337	441,691	.....	.....	.....	.....	.....	2,387.5	49,354	303,455.0	392,337	441,691	14
5,527.7	114,267	77	100	114,367	*226.7	*4,686	*91.0	*40	*4,726	5,754.4	118,953	168.0	140	119,093	15
8,280.8	171,365	15,165	19,607	190,972	44,811.5	926,330	6,331.2	8,186	934,522	53,101.3	1,097,701	21,496.2	27,793	1,125,494	16
314.4	6,499	.....	.....	6,499	316.4	*6,541	*43.3	*56	*6,597	630.8	13,040	43.3	56	13,096	17
96.7	1,998	.....	.....	1,998	.....	.....	.....	.....	.....	96.7	1,998	.....	.....	1,998	18
13,138.0	271,587	3,068,433	4,742,916	5,014,503	967.5	*20,000	*132.5	*171	*20,171	14,105.5	291,587	3,068,565.5	4,743,087	5,034,674	19
450.9	9,321	.....	.....	9,321	.....	.....	.....	.....	.....	450.9	9,321	.....	.....	9,321	20
812.7	16,800	.....	.....	16,800	5,756.6	*119,000	*788.6	*1,019	*120,019	6,569.3	135,800	788.6	1,019	136,819	21
837.9	17,321	.....	.....	17,321	.....	.....	.....	.....	.....	837.9	17,321	.....	.....	17,321	22

Estimated.

From Table CLXXII some interesting relations are deducible. It appears that of the ore mined during the census year 91.39 per cent. in tonnage was treated at the reduction works and 8.61 per cent. was left on the dumps. The average result of working treatment, as compared with assay value, was 81.86 per cent. of the gold contents, 79.68 per cent. of the silver, and 80.40 per cent. in all. Notwithstanding the large number of estimated amounts entering into the calculation, these results are probably a very close approximation to the truth.

The highest average yield was from the Arizona ores, amounting to $7 01 gold, $86 24 silver, and $93 25 total per ton. Of the localities producing any considerable amount of bullion, Dakota, with an average of $6 33 gold, $0 14 silver, and $6 47 total per ton, appears as the region where low-grade gold ores are worked to the best advantage, the percentage of yield to assay value being 82.10 per cent. in gold, 42.42 per cent. in silver, and 80.47 per cent. total.

The total product of each state and territory, including the silver contents of placer gold, appears in Table CLXXIII, which shows the aggregate bullion output of the United States for the census year.

The relative quota contributed by each of the three great arbitrary divisions into which the country has been apportioned is indicated in the accompanying abstracts, from which it will be seen that the Pacific division furnishes 75.68 per cent. of the gold, 51.43 per cent. of the silver, and 62.30 per cent. of the total. The division of the Rocky mountains yields 23.60 per cent. of the gold, 48.45 per cent. of the silver, and 37.31 per cent. of the total. The product of the Eastern division represents 0.72 per cent. of the gold, 0.12 per cent. of the silver, and 0.39 per cent. of the total.

TABLE CLXXIV.—PRODUCTION BY GEOGRAPHICAL DIVISIONS.

PACIFIC DIVISION.

State or territory.	Product.		
	Gold.	Silver.	Total.
Alaska	$5,051	$51	$6,002
Arizona	211,065	2,325,825	2,537,790
California	17,150,041	1,150,887	18,301,828
Idaho	1,479,653	464,350	1,944,003
Nevada	4,888,242	12,430,667	17,318,909
Oregon	1,097,701	27,703	1,125,404
Utah	291,587	4,743,087	5,034,674
Washington	135,800	1,019	136,819
Total	25,261,840	21,143,879	46,405,719

DIVISION OF THE ROCKY MOUNTAINS.

Colorado	$2,699,898	$16,549,274	$19,249,172
Dakota	3,805,843	70,813	3,876,656
Montana	1,805,767	2,905,068	4,710,835
New Mexico	49,354	392,337	441,691
Wyoming	17,321		17,321
Total	7,878,183	19,917,492	27,795,675

EASTERN DIVISION.

Alabama	$1,301		$1,301
Georgia	81,029	$332	81,361
Maine	2,999	7,200	10,199
Michigan		25,858	25,858
New Hampshire	10,999	16,000	26,999
North Carolina	118,953	140	119,093
South Carolina	13,040	56	13,096
Tennessee	1,998		1,998
Virginia	9,321		9,321
Total	239,640	49,586	289,226

SUMMARY.

Pacific division	$25,261,840	$21,143,879	$46,405,719
Division of the Rocky mountains	7,878,183	19,917,492	27,795,675
Eastern division	239,640	49,586	289,226
Total	33,379,663	41,110,957	74,490,620

The bullion product of the deep mines of the United States for the year under review amounted to 35 tons 900 pounds avoirdupois (1,033,974.6 ounces troy) of fine gold, and 1,087 tons 900 pounds avoirdupois (31,717,297 ounces troy) of fine silver. That of the placer mines weighed 19 tons 1,824 pounds avoirdupois (580,766.6 ounces troy) in fine gold, with which were alloyed 2 tons 1,498 pounds avoirdupois (80,177.3 ounces troy) of silver. The total weight of fine bullion was no less than 55 tons 724 pounds avoirdupois (1,614,741.2 ounces troy) of gold, and 1,090 tons 398 pounds avoirdupois (31,797,474.3 ounces troy) of silver. These huge figures may be better grasped, perhaps, by considering that the gold represents five ordinary car-loads, while a train of 109 freight cars of the usual capacity would be required to transport the silver. Historians have stated that during the early Spanish occupation whole galleons were freighted exclusively with silver from the mines of Mexico and Peru. This would hardly seem to be an exaggeration, in view of the fact that the present annual product of the United States would suffice to form the full cargo of a large modern vessel.

COMPARISONS.

The relative proportion of placer gold to that produced by the deep mines; the percentage in each class of product of the precious metals from the several mining regions of the United States; the average yield per square mile and per capita in different localities, and the rank of the states and territories in productiveness, are indicated in the following exhibits:

TABLE CLXXV.—PERCENTAGE OF PLACER GOLD AND GOLD FROM DEEP MINES IN TOTAL GOLD PRODUCT.

State or territory.	Hydraulic, placer, drift, and river mines.	Deep mines.	State or territory.	Hydraulic, placer, drift, and river mines.	Deep mines.
Alabama		100.00	New Mexico		100.00
Alaska	100.00		North Carolina	3.94	96.06
Arizona	14.15	85.85	Oregon	84.39	15.61
California	50.03	49.97	South Carolina	50.16	49.84
Colorado	3.77	96.23	Tennessee		100.00
Dakota	1.54	98.46	Utah	6.86	93.14
Georgia	82.52	17.48	Virginia		100.00
Idaho	59.45	40.55	Washington	87.63	12.37
Maine		100.00	Wyoming		100.00
Montana	64.40	35.60	United States (including Alaska)	36.06	64.03
Nevada	1.02	98.98			
New Hampshire		100.00			

TABLE CLXXVI.—RELATIVE PRODUCTION OF THE STATES AND TERRITORIES.

State or territory.	Gold.			Silver.	Total.
	Placer mines.	Deep mines.	Total gold.		
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Alabama		0.01	0.01		
Alaska	0.05		0.02		
Arizona	0.25	0.85	0.63	5.66	3.40
California	71.47	40.09	51.38	2.80	24.57
Colorado	0.85	12.16	8.09	40.25	25.84
Dakota	0.42	15.23	9.00	0.17	4.53
Georgia	0.56	0.07	0.24		0.11
Idaho	7.33	2.81	4.43	1.13	2.61
Maine		0.01	0.01	0.02	0.01
Michigan				0.06	0.03
Montana	9.69	3.01	5.41	7.07	6.34
Nevada	0.42	22.64	14.64	30.24	23.27
New Hampshire		0.05	0.03	0.04	0.04
New Mexico		0.23	0.15	0.95	0.59
North Carolina	0.04	0.53	0.36		0.16
Oregon	7.71	0.80	3.29	0.07	1.51
South Carolina	0.05	0.03	0.04		0.02
Tennessee		0.01	0.01		
Utah	0.17	1.27	0.87	11.54	6.76
Virginia		0.04	0.03		0.01
Washington	0.99	0.08	0.41		0.18
Wyoming		0.08	0.05		0.02
Total	100.00	100.00	100.00	100.00	100.00

TABLE CLXXVII.—AVERAGE PRODUCT OF GOLD AND SILVER PER SQUARE MILE AND PER CAPITA.

States and territories.	Average product.					
	Per square mile.			Per capita.		
	Gold.	Silver.	Total.	Gold.	Silver.	Total.
Alabama	$0.02	.....	$0.02	$0.001	.....	$0.001
Alaska	0.01	.....	0.01	0.20	.....	0.20
Arizona	1.87	$20.58	22.45	5.24	$57.51	62.75
California	108.30	7.27	115.57	19.83	1.33	21.16
Colorado	25.98	159.24	185.22	13.80	85.16	99.05
Dakota	22.17	0.48	22.65	24.46	0.52	24.98
Georgia	1.36	0.01	1.37	0.05	0.0002	0.05
Idaho	17.45	5.48	22.93	45.37	14.25	59.62
Maine	0.09	0.22	0.31	0.005	0.011	0.016
Michigan	.....	0.44	0.44	.....	0.02	0.02
Montana	12.36	19.89	32.25	46.11	74.19	120.30
Nevada	44.16	112.29	156.45	78.51	199.63	278.14
New Hampshire	1.18	1.72	2.90	0.03	0.05	0.08
New Mexico	0.40	3.20	3.60	0.41	3.28	3.69
North Carolina	2.28	0.003	2.28	0.08	0.0001	0.08
Oregon	11.43	0.29	11.72	6.28	0.16	6.44
South Carolina	0.43	.....	0.43	0.01	.....	0.01
Tennessee	0.05	.....	0.05	0.001	.....	0.001
Utah	3.43	55.82	59.25	2.03	32.94	34.97
Virginia	0.22	.....	0.22	0.006	.....	0.006
Washington	1.96	0.015	1.98	1.81	.....	1.81
Wyoming	0.18	.....	0.18	0.83	.....	0.83
United States (including Alaska)	0.31	11.44	20.75	0.66	0.82	1.48
United States (not including Alaska)	11.03	13.59	24.62	0.66	0.82	1.48
United States (including only the states and territories producing gold and silver, with Alaska)	14.08	18.02	32.70	2.60	3.20	5.80
United States (including only the states and territories producing gold and silver, and not including Alaska)	19.44	23.94	43.38	2.61	3.21	5.82
Average for Colorado, California, Nevada, Utah, Montana, Dakota, Arizona, and Idaho	33.47	42.74	76.21	21.04	26.87	47.91

TABLE CLXXVIII.—RANK OF THE STATES AND TERRITORIES IN PRODUCTION OF THE PRECIOUS METALS.

In actual product.			In product per square mile.			In product per capita.		
Gold.	Silver.	Total.	Gold.	Silver.	Total.	Gold.	Silver.	Total.
1. California.	1. Colorado.	1. Colorado.	1. California.	1. Colorado.	1. Colorado.	1. Nevada.	1. Nevada.	1. Nevada.
2. Nevada.	2. Nevada.	2. California.	2. Nevada.	2. Nevada.	2. Nevada.	2. Montana.	2. Colorado.	2. Montana.
3. Dakota.	3. Utah.	3. Nevada.	3. Colorado.	3. Utah.	3. California.	3. Idaho.	3. Montana.	3. Colorado.
4. Colorado.	4. Montana.	4. Utah.	4. Dakota.	4. Arizona.	4. Utah.	4. Dakota.	4. Arizona.	4. Arizona.
5. Montana.	5. Arizona.	5. Montana.	5. Idaho.	5. Montana.	5. Montana.	5. California.	5. Utah.	5. Idaho.
6. Idaho.	6. California.	6. Dakota.	6. Montana.	6. California.	6. Idaho.	6. Colorado.	6. Idaho.	6. Utah.
7. Oregon.	7. Idaho.	7. Arizona.	7. Oregon.	7. Idaho.	7. Dakota.	7. Oregon.	7. New Mexico.	7. Dakota.
8. Utah.	8. New Mexico.	8. Idaho.	8. Utah.	8. New Mexico.	8. Arizona.	8. Arizona.	8. California.	8. California.
9. Arizona.	9. Dakota.	9. Oregon.	9. N. Carolina.	9. Dakota.	9. Oregon.	9. Utah.	9. Dakota.	9. Oregon.
10. Washington.	10. Michigan.	10. New Mexico.	10. Washington.	10. Michigan.	10. New Mexico.	10. Washington.	10. Oregon.	10. New Mexico.
11. N. Carolina.	11. Oregon.	11. Washington.	11. Arizona.	11. Maine.	11. N.Hampshi'e.	11. Wyoming.	11. N.Hampshi'e.	11. Washington.
12. Georgia.	12. N.Hampshi'e.	12. N. Carolina.	12. Georgia.	12. Oregon.	12. N. Carolina.	12. New Mexico.	12. Michigan.	12. Wyoming.
13. New Mexico.	13. Maine.	13. Georgia.	13. N. Hampshire.	13. N. Carolina.	13. Washington.	13. Alaska.	13. Maine.	13. Alaska.
14. Wyoming.		14. N.Hampshi'e.	14. S. Carolina.		14. Georgia.	14. N. Carolina.		14. N. Carolina.
15. S. Carolina.		15. Michigan.	15. New Mexico.		15. Michigan.	15. Georgia.		15. N.Hampshi'e.
16. N. Hampshire.		16. Wyoming.	16. Virginia.		16. S. Carolina.	16. N. Hampshire.		16. Georgia.
17. Virginia.		17. S. Carolina.	17. Wyoming.		17. Maine.	17. S. Carolina.		17. Michigan.
18. Alaska.		18. Maine.	18. Maine.		18. Virginia.	18. Virginia.		18. Maine.
19. Maine.		19. Virginia.	19. Tennessee.		19. Wyoming.	19. Maine.		19. S. Carolina.
20. Tennessee.		20. Alaska.	20. Alabama.		20. Tennessee.	20. Tennessee.		20. Tennessee.
21. Alabama.		21. Tennessee.	21. Alaska.		21. Alabama.	21. Alabama.		21. Virginia.
		22. Alabama.			22. Alaska.			22. Alabama.

PRODUCTION UNACCOUNTED FOR IN THE PRECEDING TABLES.

In addition to the returns received directly from the mines, there are several minor points to be included in the total yield. A larger item than it is usually considered to be is the annual hoarding of rich specimens. This is not accounted for in the mine production as reported. While it is impossible to state the actual amount thus absorbed with any degree of precision, a careful estimate would place the value of the gold nuggets and ore annually added to the cabinets of collectors at not less than $150,000, and that of the silver ore at about $50,000. This, in view of the great number of mineral collections maintained throughout the mining territory, is certainly not an overestimate.

There is also quite an extensive manufacture of gold quartz into jewelry and souvenirs, particularly in San Francisco. The value so absorbed probably does not fall short of $50,000 annually. In 1870 the United States mining commissioner estimated the amount of gold hoarded as specimens or worked up by local jewelers at $400,000. The same authority, at that period, estimated the annual loss of gold-dust in handling as currency at $100,000. As the practice of using dust for money has almost disappeared, the amount so lost is now very small.

Another indefinite quantity is the value of precious metal lost in melting, in assay grains, etc. Summing up the estimates for these additional items, the following result is reached:

TABLE CLXXIX.—PRODUCTION UNACCOUNTED FOR IN TABULATION.

	Gold.	Silver.	Total.
Bullion product shown in preceding tables	$33,379,063	$41,110,957	$74,490,020
Estimated value of specimens hoarded	150,000	50,000	200,000
Estimated value of gold quartz made into jewelry and souvenirs	50,000	.....	50,000
Estimated value of gold dust lost in handling as currency	10,000	.....	10,000
Estimated loss in melting and assaying, assay grains, etc	20,000	10,000	30,000
Total	33,609,063	41,170,957	74,780,020

ASSAY VALUE OF FINE BULLION.

For convenience in referring to the dual series of troy weights of fine bullion and their equivalent assay values, the following conversion tables, which were prepared for use in tabulating the census statistics of production, are here appended:

TABLE CLXXX.—CONVERSION OF TROY OUNCES

GOLD.

1 ounce Troy = $20.671834. 1 dollar = 0.048374957925 ounce Troy.

	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.
1	1	20.671834	11	227.390174	21	434.108514	31	640.826854	41	847.545194
2	2	41.343668	12	248.062008	22	454.780348	32	661.498688	42	868.217028
3	3	62.015502	13	268.733842	23	475.452182	33	682.170522	43	888.888862
4	4	82.687336	14	289.405676	24	496.124016	34	702.842356	44	909.560696
5	5	103.359170	15	310.077510	25	516.795850	35	723.514190	45	930.232530
6	6	124.031004	16	330.749344	26	537.467684	36	744.186024	46	950.904364
7	7	144.702838	17	351.421178	27	558.139518	37	764.857858	47	971.576198
8	8	165.374672	18	372.093012	28	578.811352	38	785.529692	48	992.248032
9	9	186.046506	19	392.764846	29	599.483186	39	806.201526	49	1,012.919866
10	10	206.718340	20	413.436680	30	620.155020	40	826.873360	50	1,033.591700

	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.
1	100	2,067.1834	1,100	22,739.0174	2,100	43,410.8514	3,100	64,082.6854	4,100	84,754.5194
2	200	4,134.3668	1,200	24,806.2008	2,200	45,478.0348	3,200	66,149.8688	4,200	86,821.7028
3	300	6,201.5502	1,300	26,873.3842	2,300	47,545.2182	3,300	68,217.0522	4,300	88,888.8862
4	400	8,268.7336	1,400	28,940.5676	2,400	49,612.4016	3,400	70,284.2356	4,400	90,956.0696
5	500	10,335.9170	1,500	31,007.7510	2,500	51,679.5850	3,500	72,351.4190	4,500	93,023.2530
6	600	12,403.1004	1,600	33,074.9344	2,600	53,746.7684	3,600	74,418.6024	4,600	95,090.4364
7	700	14,470.2838	1,700	35,142.1178	2,700	55,813.9518	3,700	76,485.7858	4,700	97,157.6198
8	800	16,537.4672	1,800	37,209.3012	2,800	57,881.1352	3,800	78,552.9692	4,800	99,224.8032
9	900	18,604.6506	1,900	39,276.4846	2,900	59,948.3186	3,900	80,620.1526	4,900	101,291.9866
10	1,000	20,671.8340	2,000	41,343.6680	3,000	62,015.5020	4,000	82,687.3360	5,000	103,359.1700

SILVER.

1 ounce Troy = $1.2929. 1 dollar = 0.773455023513 ounce Troy.

	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.
1	1	1.2929	11	14.2219	21	27.1509	31	40.0799	41	53.0089
2	2	2.5858	12	15.5148	22	28.4438	32	41.3728	42	54.3018
3	3	3.8787	13	16.8077	23	29.7367	33	42.6657	43	55.5947
4	4	5.1716	14	18.1006	24	31.0296	34	43.9586	44	56.8876
5	5	6.4645	15	19.3935	25	32.3225	35	45.2515	45	58.1805
6	6	7.7574	16	20.6864	26	33.6154	36	46.5444	46	59.4734
7	7	9.0503	17	21.9793	27	34.9083	37	47.8373	47	60.7663
8	8	10.3432	18	23.2722	28	36.2012	38	49.1302	48	62.0592
9	9	11.6361	19	24.5651	29	37.4941	39	50.4231	49	63.3521
10	10	12.9290	20	25.8580	30	38.7870	40	51.7160	50	64.6450

	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.
1	100	129.29	1,100	1,422.19	2,100	2,715.09	3,100	4,007.99	4,100	5,300.89
2	200	258.58	1,200	1,551.48	2,200	2,844.38	3,200	4,137.28	4,200	5,430.18
3	300	387.87	1,300	1,680.77	2,300	2,973.67	3,300	4,266.57	4,300	5,559.47
4	400	517.16	1,400	1,810.06	2,400	3,102.96	3,400	4,395.86	4,400	5,688.76
5	500	646.45	1,500	1,939.35	2,500	3,232.25	3,500	4,525.15	4,500	5,818.05
6	600	775.74	1,600	2,068.64	2,600	3,361.54	3,600	4,654.44	4,600	5,947.34
7	700	905.03	1,700	2,197.93	2,700	3,490.83	3,700	4,783.73	4,700	6,076.63
8	800	1,034.32	1,800	2,327.22	2,800	3,620.12	3,800	4,913.02	4,800	6,205.92
9	900	1,163.61	1,900	2,456.51	2,900	3,749.41	3,900	5,042.31	4,900	6,335.21
10	1,000	1,292.90	2,000	2,585.80	3,000	3,878.70	4,000	5,171.60	5,000	6,464.50

OF FINE METAL INTO UNITED STATES MONEY.

GOLD.

1 ounce Troy = $20.671834. 1 dollar = 0.048374957925 ounce Troy.

Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	
51	1,054.263534	61	1,260.981874	71	1,467.700214	81	1,674.418554	91	1,881.136894	1
52	1,074.935368	62	1,281.653708	72	1,488.372048	82	1,695.090388	92	1,901.808728	2
53	1,095.607202	63	1,302.325542	73	1,509.043882	83	1,715.762222	93	1,922.480562	3
54	1,116.279036	64	1,322.997376	74	1,529.715716	84	1,736.434056	94	1,943.152396	4
55	1,136.950870	65	1,343.669210	75	1,550.387550	85	1,757.105890	95	1,963.824230	5
56	1,157.622704	66	1,364.341044	76	1,571.059384	86	1,777.777724	96	1,984.496064	6
57	1,178.294538	67	1,385.012878	77	1,591.731218	87	1,798.449558	97	2,005.167898	7
58	1,198.966372	68	1,405.684712	78	1,612.403052	88	1,819.121392	98	2,025.839732	8
59	1,219.638206	69	1,426.356546	79	1,633.074886	89	1,839.793226	99	2,046.511566	9
60	1,240.310040	70	1,447.028380	80	1,653.746720	90	1,860.465060	100	2,067.183400	10

Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	
5,100	105,426.3534	6,100	126,098.1874	7,100	146,770.0214	8,100	167,441.8554	9,100	188,113.6894	1
5,200	107,493.5368	6,200	128,165.3708	7,200	148,837.2048	8,200	169,509.0388	9,200	190,180.8728	2
5,300	109,560.7202	6,300	130,232.5542	7,300	150,904.3882	8,300	171,576.2222	9,300	192,248.0562	3
5,400	111,627.9036	6,400	132,299.7376	7,400	152,971.5716	8,400	173,643.4056	9,400	194,315.2396	4
5,500	113,695.0870	6,500	134,366.9210	7,500	155,038.7550	8,500	175,710.5890	9,500	196,382.4230	5
5,600	115,762.2704	6,600	136,434.1044	7,600	157,105.9384	8,600	177,777.7724	9,600	198,449.6064	6
5,700	117,829.4538	6,700	138,501.2878	7,700	159,173.1218	8,700	179,844.9558	9,700	200,516.7898	7
5,800	119,896.6372	6,800	140,568.4712	7,800	161,240.3052	8,800	181,912.1392	9,800	202,583.9732	8
5,900	121,963.8206	6,900	142,635.6546	7,900	163,307.4886	8,900	183,979.3226	9,900	204,651.1566	9
6,000	124,031.0040	7,000	144,702.8380	8,000	165,374.6720	9,000	186,046.5060	10,000	206,718.3400	10

SILVER.

1 ounce Troy = $1.2929. 1 dollar = 0.773455023513 ounce Troy.

Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	
51	65.9370	61	78.8669	71	91.7959	81	104.7249	91	117.6539	1
52	67.2308	62	80.1598	72	93.0888	82	106.0178	92	118.9468	2
53	68.5237	63	81.4527	73	94.3817	83	107.3107	93	120.2397	3
54	69.8166	64	82.7456	74	95.6746	84	108.6036	94	121.5326	4
55	71.1095	65	84.0385	75	96.9675	85	109.8965	95	122.8255	5
56	72.4024	66	85.3314	76	98.2604	86	111.1894	96	124.1184	6
57	73.6953	67	86.6243	77	99.5533	87	112.4823	97	125.4113	7
58	74.9882	68	87.9172	78	100.8462	88	113.7752	98	126.7042	8
59	76.2811	69	89.2101	79	102.1391	89	115.0681	99	127.9971	9
60	77.5740	70	90.5030	80	103.4320	90	116.3610	100	129.2900	10

Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	
5,100	6,593.79	6,100	7,886.69	7,100	9,179.59	8,100	10,472.49	9,100	11,765.39	1
5,200	6,723.08	6,200	8,015.98	7,200	9,308.88	8,200	10,601.78	9,200	11,894.68	2
5,300	6,852.37	6,300	8,145.27	7,300	9,438.17	8,300	10,731.07	9,300	12,023.97	3
5,400	6,981.66	6,400	8,274.56	7,400	9,567.46	8,400	10,860.36	9,400	12,153.26	4
5,500	7,110.95	6,500	8,403.85	7,500	9,696.75	8,500	10,989.65	9,500	12,282.55	5
5,600	7,240.24	6,600	8,533.14	7,600	9,826.04	8,600	11,118.94	9,600	12,411.84	6
5,700	7,369.53	6,700	8,662.43	7,700	9,955.33	8,700	11,248.23	9,700	12,541.13	7
5,800	7,498.82	6,800	8,791.72	7,800	10,084.62	8,800	11,377.52	9,800	12,670.42	8
5,900	7,628.11	6,900	8,921.01	7,900	10,213.91	8,900	11,506.81	9,900	12,799.71	9
6,000	7,757.40	7,000	9,050.30	8,000	10,343.20	9,000	11,636.10	10,000	12,929.00	10

TABLE CLXXXI.—CONVERSION OF UNITED STATES

GOLD.

1 dollar = 0.048374957925 ounce Troy. 1 ounce Troy = $20.671834.

	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.
1	1	0.048375	11	0.532125	21	1.015874	31	1.499624	41	1.983373
2	2	0.096750	12	0.580499	22	1.064249	32	1.547999	42	2.031748
3	3	0.145125	13	0.628874	23	1.112624	33	1.596374	43	2.080123
4	4	0.193500	14	0.677249	24	1.160999	34	1.644749	44	2.128498
5	5	0.241875	15	0.725624	25	1.209374	35	1.693124	45	2.176873
6	6	0.290250	16	0.773999	26	1.257749	36	1.741498	46	2.225248
7	7	0.338625	17	0.822374	27	1.306124	37	1.789873	47	2.273623
8	8	0.387000	18	0.870749	28	1.354499	38	1.838248	48	2.321998
9	9	0.435375	19	0.919124	29	1.402874	39	1.886623	49	2.370373
10	10	0.483750	20	0.967499	30	1.451249	40	1.934998	50	2.418748

	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.
1	100	4.837496	1,100	53.212454	2,100	101.587412	3,100	149.962370	4,100	198.337327
2	200	9.674992	1,200	58.049950	2,200	106.424907	3,200	154.799865	4,200	203.174823
3	300	14.512487	1,300	62.887445	2,300	111.262403	3,300	159.637361	4,300	208.012319
4	400	19.349983	1,400	67.724941	2,400	116.099899	3,400	164.474857	4,400	212.849815
5	500	24.187479	1,500	72.562437	2,500	120.937395	3,500	169.312353	4,500	217.687311
6	600	29.024975	1,600	77.399933	2,600	125.774891	3,600	174.149849	4,600	222.524806
7	700	33.862471	1,700	82.237428	2,700	130.612386	3,700	178.987344	4,700	227.362302
8	800	38.699966	1,800	87.074924	2,800	135.449882	3,800	183.824840	4,800	232.199798
9	900	43.537462	1,900	91.912420	2,900	140.287378	3,900	188.662336	4,900	237.037294
10	1,000	48.374958	2,000	96.749916	3,000	145.124874	4,000	193.499832	5,000	241.874790

SILVER.

1 dollar = 0.773455023513 Troy ounce. 1 ounce Troy = $1.2929.

	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.
1	1	0.77346	11	8.50801	21	16.24256	31	23.97711	41	31.71166
2	2	1.54691	12	9.28146	22	17.01601	32	24.75056	42	32.48511
3	3	2.32037	13	10.05492	23	17.78947	33	25.52402	43	33.25857
4	4	3.09382	14	10.82837	24	18.56292	34	26.29747	44	34.03202
5	5	3.86728	15	11.60183	25	19.33638	35	27.07093	45	34.80548
6	6	4.64073	16	12.37528	26	20.10983	36	27.84438	46	35.57893
7	7	5.41419	17	13.14874	27	20.88329	37	28.61784	47	36.35239
8	8	6.18764	18	13.92219	28	21.65674	38	29.39129	48	37.12584
9	9	6.96110	19	14.69565	29	22.43020	39	30.16475	49	37.89930
10	10	7.73455	20	15.46910	30	23.20365	40	30.93820	50	38.67275

	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.
1	100	77.34550	1,100	850.80053	2,100	1,624.25555	3,100	2,397.71057	4,100	3,171.16560
2	200	154.69100	1,200	928.14603	2,200	1,701.60105	3,200	2,475.05608	4,200	3,248.51110
3	300	232.03651	1,300	1,005.49153	2,300	1,778.94655	3,300	2,552.40158	4,300	3,325.85660
4	400	309.38201	1,400	1,082.83703	2,400	1,856.29206	3,400	2,629.74708	4,400	3,403.20210
5	500	386.72751	1,500	1,160.18254	2,500	1,933.63756	3,500	2,707.09258	4,500	3,480.54761
6	600	464.07301	1,600	1,237.52804	2,600	2,010.98306	3,600	2,784.43808	4,600	3,557.89311
7	700	541.41852	1,700	1,314.87354	2,700	2,088.32856	3,700	2,861.78359	4,700	3,635.23861
8	800	618.76402	1,800	1,392.21904	2,800	2,165.67407	3,800	2,939.12909	4,800	3,712.58411
9	900	696.10952	1,900	1,469.56454	2,900	2,243.01957	3,900	3,016.47459	4,900	3,789.92962
10	1,000	773.45502	2,000	1,546.91005	3,000	2,320.36507	4,000	3,093.82009	5,000	3,867.27512

MONEY INTO TROY OUNCES OF FINE METAL.

GOLD.

1 dollar = 0.048374057925 ounce Troy. 1 ounce Troy = $20.671834.

Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	
51	2.467123	61	2.950872	71	3.434622	81	3.918372	91	4.402121	1
52	2.515498	62	2.999247	72	3.482997	82	3.966747	92	4.450496	2
53	2.563873	63	3.047622	73	3.531372	83	4.015122	93	4.498871	3
54	2.612248	64	3.095997	74	3.579747	84	4.063496	94	4.547246	4
55	2.660623	65	3.144372	75	3.628122	85	4.111871	95	4.595621	5
56	2.708998	66	3.192747	76	3.676497	86	4.160246	96	4.643996	6
57	2.757373	67	3.241122	77	3.724872	87	4.208621	97	4.692371	7
58	2.805748	68	3.289497	78	3.773247	88	4.256996	98	4.740746	8
59	2.854123	69	3.337872	79	3.821622	89	4.305371	99	4.789121	9
60	2.902497	70	3.386247	80	3.869997	90	4.353746	100	4.837496	10

Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	
5,100	246.712285	6,100	295.087243	7,100	343.462201	8,100	391.837159	9,100	440.212117	1
5,200	251.540781	6,200	299.924739	7,200	348.299697	8,200	396.674655	9,200	445.049613	2
5,300	256.387277	6,300	304.762235	7,300	353.137193	8,300	401.512151	9,300	449.887109	3
5,400	261.224773	6,400	309.599731	7,400	357.974689	8,400	406.349647	9,400	454.724604	4
5,500	266.062269	6,500	314.437227	7,500	362.812184	8,500	411.187142	9,500	459.562100	5
5,600	270.899764	6,600	319.274722	7,600	367.649680	8,600	416.024638	9,600	464.399596	6
5,700	275.737260	6,700	324.112218	7,700	372.487176	8,700	420.862134	9,700	469.237092	7
5,800	280.574756	6,800	328.949714	7,800	377.324672	8,800	425.699630	9,800	474.074588	8
5,900	285.412252	6,900	333.787210	7,900	382.162168	8,900	430.537126	9,900	478.912083	9
6,000	290.249748	7,000	338.624705	8,000	387.999663	9,000	435.374621	10,000	483.749579	10

SILVER.

1 dollar = 0.773455023513 Troy ounce. 1 ounce Troy = $1.2929.

Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	
51	39.44621	61	47.18076	71	54.91531	81	62.64986	91	70.38441	1
52	40.21966	62	47.95421	72	55.68876	82	63.42331	92	71.15786	2
53	40.99312	63	48.72767	73	56.46222	83	64.19677	93	71.93132	3
54	41.76657	64	49.50112	74	57.23567	84	64.97022	94	72.70477	4
55	42.54003	65	50.27458	75	58.00913	85	65.74368	95	73.47823	5
56	43.31348	66	51.04803	76	58.78258	86	66.51713	96	74.25168	6
57	44.08694	67	51.82149	77	59.55604	87	67.29059	97	75.02514	7
58	44.86039	68	52.59494	78	60.32949	88	68.06404	98	75.79859	8
59	45.63385	69	53.36840	79	61.10295	89	68.83750	99	76.57205	9
60	46.40730	70	54.14185	80	61.87640	90	69.61095	100	77.34550	10

Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	Dollars.	Ounces.	
5,100	3,944.62062	6,100	4,718.07564	7,100	5,491.53067	8,100	6,264.98569	9,100	7,038.44071	1
5,200	4,021.96612	6,200	4,795.42115	7,200	5,568.87617	8,200	6,342.33119	9,200	7,115.78622	2
5,300	4,099.31162	6,300	4,872.76665	7,300	5,646.22167	8,300	6,419.67670	9,300	7,193.13172	3
5,400	4,176.65713	6,400	4,950.11215	7,400	5,723.56717	8,400	6,497.02220	9,400	7,270.47722	4
5,500	4,254.00263	6,500	5,027.45765	7,500	5,800.91268	8,500	6,574.36770	9,500	7,347.82272	5
5,600	4,331.34813	6,600	5,104.80316	7,600	5,878.25818	8,600	6,651.71320	9,600	7,425.16823	6
5,700	4,408.69363	6,700	5,182.14866	7,700	5,955.60368	8,700	6,729.05870	9,700	7,502.51373	7
5,800	4,486.03914	6,800	5,259.49416	7,800	6,032.94918	8,800	6,806.40421	9,800	7,579.85923	8
5,900	4,563.38464	6,900	5,336.83966	7,900	6,110.29469	8,900	6,883.74971	9,900	7,657.20473	9
6,000	4,640.73014	7,000	5,414.18516	8,000	6,187.64019	9,000	6,961.09521	10,000	7,734.55024	10

DISCOUNT AND MARKET VALUE.

The figures given in the preceding tables are of assay values, and are therefore considerably higher than the actual market value. Disregarding express charges, commissions, and cost of refining and coining, there is still a large deduction to be made for this discount, in estimating the cash value of the bullion to the producers. Assuming the gold to have brought on the average $20 per troy ounce and the silver $1 12½ per troy ounce, the cash received would have been $32,394,794 for the gold, $35,772,160 for the silver, and $68,166,954 total. The loss to the miners, as compared with the full assay value, would therefore have been $984,869 on the gold, $5,338,797 on the silver, and $6,323,666 altogether, or about one thirty-fourth of the full gold coining value, over one-eighth of the nominal silver value, and over one-twelfth in all, during the single census year. While there is no regular discount on gold, the large amount of placer gold sold at an undervaluation renders the average price assumed a probable one. The price for the silver is an estimate of average local rates for the year.

THE OUTLOOK.

The immediate outlook for the precious-metal mines, as a whole, is very encouraging. The great Leadville (Colorado), Eureka (Nevada), Tombstone (Arizona), and Bodie (California) districts are maintaining a steady output, while the new Wood River and other districts in Idaho, and a number of recent discoveries in Arizona, hold forth great promise for the future. In fact, estimates of the yield subsequent to the census period indicate an actual and considerable gain.(*a*)

TRANSPORTATION OF BULLION.

INTERNAL MOVEMENT.—The internal movement of the precious metals is to a certain extent indicated by the returns of the express companies. Notwithstanding the sources of error inherent in these transportation statistics when adopted as the sole basis for an estimate of the mine output, which have already been commented upon, the express figures in many cases serve as a means of supplying deficiencies in the census schedule data, and are always useful as a check upon information collected directly from the mines.

The operations of Wells, Fargo & Co.'s Express during the census year, and for the months corresponding at the beginning and at the close of that period, are shown in the accompanying table:

TABLE CLXXXII.—SHIPMENTS OF BULLION, DUST, AND AMALGAM THROUGH WELLS, FARGO & CO.'S EXPRESS.

ARIZONA.

Office.	Shipments during census year.			Shipments in June, 1879.			Shipments in June, 1880.		
	Gold bullion, dust, and amalgam.	Silver bullion and amalgam.	Total.	Gold bullion, dust, and amalgam.	Silver bullion and amalgam.	Total.	Gold bullion, dust, and amalgam.	Silver bullion and amalgam.	Total.
Casa Grande		$385	$385						
Contention City		122,900	122,900					$76,960	$76,960
Florence		177,568	177,568		$11,004	$11,004			
Globe								4,631	4,631
Maricopa	$160	301,273	301,433		25,031	25,031			
Millville		78,153	78,153					77,868	77,868
Phœnix	56,475	113,495	169,970	$600	19,355	19,955	$1,421	750	2,171
Prescott	31,750	116,937	148,687	5,050	1,819	6,869	4,980	2,141	7,121
Tombstone		300	300						
Tucson	60,529	469,140	529,669	10,661	3,129	13,790	3,420	11,711	15,131
Wickenburg	36,138	8,842	44,980	400	1,558	1,958	420	325	745
Yuma	39,416	13,707	53,123	1,090		1,090	1,700		1,700
Total	224,468	1,402,700	1,627,168	17,801	61,896	79,697	11,941	174,386	186,327

CALIFORNIA.

Alleghany	$31,726		$31,726	$4,676		$4,676	$2,917		$2,917
Alta	450		450						
Alvarado									
Amador	634,720		634,720	73,400		73,400	44,001		44,001
Anderson	11,420		11,420	705		705	900		900
Angel's Camp	54,759		54,759	1,520		1,520	5,964		5,964
Arcata	58,731		58,731	4,150		4,150	1,461		1,461
Auburn	171,930		171,930	12,920		12,920	20,180		20,180
Bakersfield	13,166		13,166	1,105		1,105	1,955		1,955
Bear Valley	14,954		14,954	422		422	2,000		2,000
Benton		$137,876	137,876		$17,758	17,758			
Berendo	2,625		2,625	437		437	332		332
Biggs	1,500		1,500						
Big Oak Flat	20,545	930	21,475	3,040		3,040	3,800		3,800
Bishop Creek	214	50	264						

(*a*) While this report was going through the press, Wells, Fargo & Co. reported the yield of the mines of the western states and territories, together with that from British Columbia, to have been $31,869,686 gold, $45,077,829 silver, and $76,947,515 total, for the calendar year 1881.

TABLE CLXXXII.—SHIPMENTS OF BULLION, DUST, AND AMALGAM, ETC.—Continued.

CALIFORNIA—Continued.

Office.	Shipments during census year.			Shipments in June, 1879.			Shipments in June, 1880.		
	Gold bullion, dust, and amalgam.	Silver bullion and amalgam.	Total.	Gold bullion, dust, and amalgam.	Silver bullion and amalgam.	Total.	Gold bullion, dust, and amalgam.	Silver bullion and amalgam.	Total.
Blue Cañon	$3,421	.....	$3,421	$1,150	.....	$1,150	$2,150	.....	$2,150
Bodie	2,708,038	$375	2,708,413	143,933	$375	144,308	298,550	.....	298,550
Borden	18,767	.....	18,767	1,635	.....	1,635	700	.....	700
Brownsville	17,840	.....	17,840	1,275	.....	1,275	5,989	.....	5,989
Caliente	2,985	.....	2,985	60	.....	60	3,745	.....	3,745
Callahan's Ranch	71,371	.....	71,371	5,155	.....	5,155	3,137	.....	3,137
Camanche	49,605	.....	49,605	6,000	.....	6,000	2,900	.....	2,900
Campo Seco	13,970	.....	13,970	535	.....	535	1,040	.....	1,040
Camptonville	204,185	.....	204,185	28,850	.....	28,850	40,500	.....	40,500
Centreville	165	.....	165	100	.....	100	.....	.....	.....
Chico	86,009	.....	86,009	8,565	.....	8,565	6,585	.....	6,585
Chinese Camp	37,520	.....	37,520	2,560	.....	2,560	3,968	.....	3,968
Chualar	122	.....	122	.....	.....	.....	.....	.....	.....
Clipper Mills	9,125	.....	9,125	512	.....	512	1,125	.....	1,125
Colfax	67,928	.....	67,928	9,550	.....	9,550	9,425	.....	9,425
Columbia	107,125	.....	107,125	14,020	.....	14,020	13,550	.....	13,550
Columbus	38,579	.....	38,579	5,980	.....	5,980	2,255	.....	2,255
Copper City	200	111,949	112,149	200	13,517	13,717	.....	.....	.....
Copperopolis	1,688	.....	1,688	413	.....	413	150	.....	150
Cottonwood	46,630	.....	46,630	2,680	.....	2,680	2,100	.....	2,100
Coulterville	42,412	.....	42,412	6,055	.....	6,055	12,570	.....	12,570
Crescent City	14,315	.....	14,315	2,025	.....	2,025	20	.....	20
Crescent Mills	23,607	.....	23,607	1,080	.....	1,080	8,170	.....	8,170
Darwin	6,105	41,004	47,109	2,334	10,300	12,634	106	$0,750	9,856
Delano	75	.....	75	.....	.....	.....	.....	.....	.....
Diamond Spring	5,202	.....	5,202	866	.....	866	.....	.....	.....
Downieville	55,694	.....	55,694	5,443	.....	5,443	570	.....	570
Drytown	57,564	.....	57,564	5,530	.....	5,530	9,096	.....	9,096
Dutch Flat	305,045	.....	305,045	32,475	.....	32,475	32,650	.....	32,650
El Dorado	73,921	.....	73,921	13,820	.....	13,820	5,787	.....	5,787
Emigrant Gap	5,777	.....	5,777	75	.....	75	.....	.....	.....
Etna Mills	238,056	.....	238,056	23,395	.....	23,395	22,080	.....	22,080
Eureka	62,902	100	63,002	5,690	.....	5,690	1,350	.....	1,350
Eureka Mills	539,870	.....	539,870	46,000	.....	46,000	41,500	.....	41,500
Farmington	110	.....	110	.....	.....	.....	.....	.....	.....
Firebaugh	130	.....	130	.....	.....	.....	.....	.....	.....
Folsom City	345,265	.....	345,265	32,950	.....	32,950	29,760	.....	29,760
Forbestown	30,127	.....	30,127	6,713	.....	6,713	2,439	.....	2,439
Forest City	205,675	.....	205,675	13,000	.....	13,000	33,500	.....	33,500
Forest Hill	134,937	.....	134,937	13,046	.....	13,046	18,150	.....	18,150
Fort Jones	204,187	.....	204,187	22,180	.....	22,180	8,397	.....	8,397
French Corral	400,916	.....	400,916	50,595	.....	50,595	24,140	.....	24,140
French Gulch	52,402	.....	52,402	9,049	.....	9,049	5,599	.....	5,599
Fresno	20,969	.....	20,969	432	.....	432	1,632	.....	1,632
Georgetown	85,200	.....	85,200	12,700	.....	12,700	10,860	.....	10,860
Gibsonville	88,143	.....	88,143	3,200	.....	3,200	7,900	.....	7,900
Gold Run	53,111	.....	53,111	11,483	.....	11,483	2,760	.....	2,760
Grass Valley	780,705	.....	780,705	87,250	.....	87,250	91,200	.....	91,200
Grayson	22	.....	22	.....	.....	.....	.....	.....	.....
Greenville	43,617	.....	43,617	2,885	.....	2,885	5,410	.....	5,410
Guadaloupe	112	.....	112	.....	.....	.....	.....	.....	.....
Havilah	36,415	.....	36,415	6,308	.....	6,308	745	.....	745
Hornitos	121,829	.....	121,829	12,500	.....	12,500	18,055	.....	18,055
Howland's	112,623	.....	112,623	4,393	.....	4,393	10,115	.....	10,115
Independence	9,840	7,000	16,840	400	.....	400	300	.....	300
Ione	79,365	.....	79,365	9,095	.....	9,095	9,825	.....	9,825
Iowa Hill	108,775	.....	108,775	16,800	.....	16,800	8,275	.....	8,275
Jackson	334,056	.....	334,056	43,423	.....	43,423	36,160	.....	36,160
Jamestown	78,393	.....	78,393	9,350	.....	9,350	5,427	.....	5,427
Jamison	14,077	.....	14,077	1,250	.....	1,250	670	.....	670
Jolon	269	.....	269	.....	.....	.....	.....	.....	.....
Kernville	99,015	.....	99,015	11,625	.....	11,625	4,005	75	4,080
Knight's Ferry	11,188	150	11,338	1,736	.....	1,736	1,355	.....	1,355
La Grange	77,304	.....	77,304	7,500	.....	7,500	300	.....	300
La Porte	258,316	.....	258,316	19,690	.....	19,690	9,710	.....	9,710
Latrobe	45,903	.....	45,903	2,220	.....	2,220	3,770	.....	3,770
Lewiston	10,765	.....	10,765	2,872	.....	2,872	4,748	.....	4,748
Lincoln	26,635	.....	26,635	1,825	.....	1,825	3,250	.....	3,250
Lompoc	300	.....	300	50	.....	50	.....	.....	.....
Lone Pine	6,114	2,545	8,659	150	200	350	405	124	529
Los Angeles	14,020	56,897	70,917	2,555	1,500	4,055	2,330	7,463	9,793
Madera	5,964	.....	5,964	284	.....	284	248	.....	248
Mammoth	33,613	50	33,663	9,488	.....	9,488	.....	.....	.....
Mariposa	67,606	.....	67,606	5,533	.....	5,533	4,530	.....	4,530
Martinez	4,815	.....	4,815	.....	.....	.....	.....	.....	.....
Marysville	482,266	.....	482,266	65,678	.....	65,678	7,913	.....	7,913
Merced	8,363	.....	8,363	800	.....	800	76	.....	76
Michigan Bar	47,139	.....	47,139	2,565	.....	2,565	2,435	.....	2,435
Michigan Bluffs	93,505	.....	93,505	9,375	.....	9,375	4,525	.....	4,525
Millville	400	.....	400	.....	.....	.....	.....	.....	.....

TABLE CLXXXII.—SHIPMENTS OF BULLION, DUST, AND AMALGAM, ETC.—Continued.

CALIFORNIA—Continued.

Office.	Shipments during census year.			Shipments in June, 1879.			Shipments in June, 1880.		
	Gold bullion, dust, and amalgam.	Silver bullion and amalgam.	Total.	Gold bullion, dust, and amalgam.	Silver bullion and amalgam.	Total.	Gold bullion, dust, and amalgam.	Silver bullion and amalgam.	Total.
Milton	$16,704		$16,704	$3,110		$3,110	$2,332		$2,332
Modesto	5		5						
Mohave	220	$26,200	26,420				150		150
Mokelumne Hill	205,331		205,331	21,857		21,857	21,016		21,016
Murphy's	34,323		34,323	4,160		4,160	4,675		4,675
Nevada City	1,248,017	3,850	1,251,867	137,064	$1,160	138,224	105,090		105,090
Newcastle	54,712		54,712	6,550		6,550	2,292		2,292
Newhall	7,150		7,150	400		400	2,172		2,172
North San Juan	560,886		560,886	33,005		33,005	49,045		49,045
Oleta	48,746		48,746	6,470		6,470	6,912		6,912
Oroville	818,715		818,715	102,515		102,515	28,115		28,115
Pino	8,524		8,524	1,295		1,295	363		363
Placerville	300,397	40	300,437	32,030		32,030	41,816		41,816
Plainsburg	854		854						
Plymouth	262,593		262,593	2,172		2,172	42,050		42,050
Porterville	1,605		1,605	200		200	60		60
Quincy	48,677		48,677	5,469		5,469	3,976		3,976
Ravenna	1,089		1,089				135		135
Redding	148,214		148,214	16,530		16,530	18,734		18,734
Red Bluff	2,303		2,303	240		240			
Riverside	50		50						
Rocklin	744	125	869				197		197
Roseville	1,500		1,500						
Rough and Ready	15,114		15,114	430		430	1,150		1,150
Sacramento City	118,032		118,032	17,765		17,765	4,965		4,965
Saint Louis	4,900		4,900				4,200		4,200
Salinas	16		16						
San Andreas	154,398		154,398	20,020		20,020	11,800		11,800
San Antonio	50		50						
San Bernardino	5,212	125,942	131,154	150	5,257	5,407	230	$11,633	11,863
San Buenaventura	221		221						
San Diego	46,710		46,710	2,825		2,825	4,200		4,200
Sanel	205		205				500		500
San José	6,900		6,900	3,050		3,050			
San Luis Obispo	3,002		3,002						
Santa Cruz	58		58	58		58			
Shasta	181,834		181,834	29,760		29,760	23,893		23,893
Sheep Ranch	52,454		52,454				3,100		3,100
Shingle Springs	44,067		44,067	3,897		3,897	7,433		7,433
Sierra City	352,700		352,700	31,150		31,150	24,500		24,500
Sierraville	180		180						
Smartsville	201,070		201,070	1,280		1,280	25,960		25,960
Snelling	5,983		5,983	225		225	465		465
Soledad	225		225				100		100
Sonora	419,501		419,501	19,850		19,850	20,381		20,381
Spadra							421		421
Spanish Ranch	83,719	17,143	100,862	17,361		17,361	9,986		9,986
Sumner	1,225		1,225	500		500			
Sutter Creek	165,269		165,269	20,750		20,750	21,490		21,490
Sweetland	26,140		26,140	10,000		10,000	4,000		4,000
Tehichipa	2,632		2,632	516		516	887		887
Todd's Valley	26,864		26,864	8,690		8,690	1,225		1,225
Trinity Centre	14,147		14,147	919		919	900		900
Truckee	262		262						
Tulare	450		450						
Vallecita	10,838		10,838	1,675		1,675	417		417
Visalia	2,650	60	2,710	275		275			
Watsonville	332		332	85		85			
Weaverville	459,463		459,463	37,810		37,810	43,915		43,915
West Oakland							1,000		1,000
Wheatland	1,030		1,030	260		260			
Williams	1,375		1,375						
Yreka	81,180		81,180	8,155		8,155	4,650		4,650
Total	16,829,915	532,286	17,362,201	1,604,716	50,067	1,654,783	1,547,651	29,045	1,576,696

TABLE CLXXXII.—SHIPMENTS OF BULLION, DUST, AND AMALGAM, ETC.—Continued.

IDAHO.

Office.	Shipments during census year.			Shipments in June, 1879.			Shipments in June, 1880.		
	Gold bullion, dust, and amalgam.	Silver bullion and amalgam.	Total.	Gold bullion, dust, and amalgam.	Silver bullion and amalgam.	Total.	Gold bullion, dust, and amalgam.	Silver bullion and amalgam.	Total.
Albion	$3,145	.....	$3,145	.....	.....	.....	$424	.....	$424
Boisé City	140,859	$99,546	237,405	$8,530	$12,948	$21,478	9,625	$110	9,735
Centreville	43,215	7,873	51,088	4,070	.....	4,070	638	.....	638
Idaho City	438,012	103,530	542,142	44,289	.....	44,289	25,453	.....	25,453
Lewiston	183,125	.....	183,125	13,463	.....	13,463	137	.....	137
Moscow	794	.....	794	.....	.....	.....	.....	.....	.....
Placerville	115,833	.....	115,833	25,860	.....	25,860	4,170	.....	4,170
Quartzburg	159,500	.....	159,500	4,520	.....	4,520	18,200	.....	18,200
Rocky Bar (a)	17,309	83,712	101,021	.....	.....	.....	1,508	5,600	7,108
Silver City	18,510	340,043	358,553	2,450	11,795	14,245	1,016	11,110	13,026
Total	1,120,902	631,704	1,752,606	103,182	24,743	127,925	62,071	16,820	78,891

NEVADA.

Aurora	$2,125	.....	$2,125	$150	.....	$150	.....	.....	.....
Austin	.....	$903,375	903,375	.....	$95,788	95,788	.....	$130,791	$130,791
Battle Mountain	10	6,395	6,405	.....	.....	.....	.....	.....	.....
Belleville	.....	982,102	982,102	.....	48,757	48,757	.....	108,044	108,044
Belmont	.....	41,000	41,000	.....	.....	.....	.....	381	381
Beowawe	.....	123,992	123,992	.....	21,030	21,030	.....	.....	.....
Cambridge	250	.....	250	.....	.....	.....	$450	.....	450
Carson City	.....	28,516	28,516	.....	1,600	1,600	.....	2,322	2,322
Cherry Creek	300	283,800	284,100	.....	21,033	21,033	.....	23,000	23,000
Columbus	.....	24,990	24,990	.....	20,792	20,792	.....	.....	.....
Cornucopia	25	51,814	51,839	.....	.....	.....	.....	.....	.....
Dayton	.....	86,962	86,962	.....	22,370	22,370	.....	.....	.....
Elko	12,597	9,776	22,373	1,142	.....	1,142	.....	.....	.....
Eureka	.....	1,043,254	1,043,254	.....	153,389	153,389	.....	112,005	112,005
Franktown	.....	.....	.....	.....	.....	.....	25	.....	25
Gold Hill	28,940	22,974	51,314	3,375	10,650	14,025	.....	.....	.....
Grantsville	.....	381,365	381,365	.....	41,340	41,340	.....	26,203	26,203
Hamilton	.....	53,921	53,921	.....	17,178	17,178	.....	.....	.....
Humboldt	.....	.....	.....	.....	.....	.....	1,500	.....	1,500
Lewis	.....	139,016	139,016	.....	15,000	15,000	.....	7,000	7,000
Lovelocks	426	.....	426	61	.....	61	.....	.....	.....
Marietta	.....	58,300	58,300	.....	.....	.....	.....	.....	.....
Mill City	32,310	1,625	33,935	2,000	1,500	3,500	.....	.....	.....
Oreana	7,016	2	7,018	1,405	.....	1,405	.....	.....	.....
Paradise	100	134,536	134,636	.....	4,329	4,329	.....	10,100	10,100
Pioche	.....	287,120	287,120	.....	39,323	39,323	.....	6,950	6,950
Reno	10,080	47,620	57,700	.....	.....	.....	404	.....	404
Rye Patch	4,128	23,300	27,428	.....	17,301	17,301	777	9,065	9,842
Silver City	29,034	33,092	62,126	5,430	.....	5,430	1,480	.....	1,480
Sedan	.....	81,987	81,987	.....	.....	.....	.....	.....	.....
Silver Peak	17,124	33,482	50,606	.....	.....	.....	.....	.....	.....
Tuscarora	4,926	1,112,615	1,117,541	1,800	87,805	89,605	1,095	35,151	36,846
Tybo	.....	213,650	213,650	.....	14,800	14,800	.....	13,550	13,550
Unionville	5,471	178,478	183,949	232	15,700	15,932	267	13,200	13,467
Virginia City	.....	6,835,712	6,835,712	.....	652,715	652,715	1,500	397,860	399,360
Wadsworth	.....	701	701	.....	701	701	.....	.....	.....
Ward	10,460	281,776	292,236	2,100	51,341	53,441	700	150	850
Winnemucca	2,579	5,722	8,301	.....	1,188	1,188	.....	.....	.....
Total	167,896	14,113,084	14,280,980	17,695	1,356,530	1,374,225	8,858	901,862	910,720

OREGON.

Albany	$473	.....	$473	.....	.....	.....	.....	.....	.....
Ashland	630	.....	630	$620	.....	$620	.....	.....	.....
Aurora	150	.....	150	.....	.....	.....	.....	.....	.....
Astoria	175	.....	175	.....	.....	.....	.....	.....	.....
Baker City	355,995	$1,110	357,105	31,000	.....	31,000	$18,565	.....	$18,565
Cañonville	5,576	.....	5,576	320	.....	320	985	.....	985
Cottage Grove	120	.....	120	.....	.....	.....	25	.....	25
Corvallis	.....	.....	.....	.....	.....	.....	400	.....	400
Dalles	35,065	.....	35,065	175	.....	175	.....	.....	.....
Empire City	1,316	.....	1,316	.....	.....	.....	.....	.....	.....
Hepner	100	.....	100	.....	.....	.....	.....	.....	.....
Hillsborough	.....	155	155	.....	.....	.....	.....	.....	.....
Jacksonville	148,224	.....	148,224	19,552	.....	19,552	24,830	.....	24,830
La Grande	2,025	25	2,050	.....	.....	.....	.....	.....	.....
Oakland	480	.....	480	.....	.....	.....	.....	.....	.....

(a) Through W. C. Tatro's Express.

TABLE CLXXXII.—SHIPMENTS OF BULLION, DUST, AND AMALGAM, ETC.—Continued.

OREGON.—Continued.

Office.	Shipments during census year.			Shipments in June, 1879.			Shipments in June, 1880.		
	Gold bullion, dust, and amalgam.	Silver bullion and amalgam.	Total.	Gold bullion, dust, and amalgam.	Silver bullion and amalgam.	Total.	Gold bullion, dust, and amalgam.	Silver bullion and amalgam.	Total.
Pendleton	$23,912	$0 75	$23,987	$1,400	.....	$1,400	.....	.....	.....
Portland	274,176	3,145	277,321	20,092	.....	20,092	$11,449	.....	$11,449
Roseburg	6,468	.....	6,468	2,342	.....	2,342	1,837	.....	1,837
Umatilla	26,514	.....	26,514	2,301	.....	2,301	1,317	.....	1,317
Union	40,892	.....	40,892	200	.....	200	361	.....	361
Total	922,381	4,510	926,891	78,002	.....	78,002	50,709	.....	50,709

UTAH.

Corinne	$244	.....	$244	$75	.....	$75	.....	.....	.....
Kelton	5,062	.....	5,062	350	.....	350	$175	.....	$175
Leeds	.....	$1,003,633	1,003,633	.....	$102,020	102,020	.....	$113,013	113,013
Ogden	767,956	1,233,444	2,001,400	38,797	102,611	201,408	72,527	59,812	132,339
Total	773,262	2,237,077	3,010,339	39,222	265,531	304,753	72,702	172,825	245,527

WASHINGTON.

Colfax	$10,165	.....	$10,165	.....	.....	.....	$1,205	.....	$1,205
Dayton	263	.....	263	$60	.....	$60	.....	.....	.....
Goldendale	294	.....	294	.....	.....	.....	.....	.....	.....
Pomeroy	1,103	.....	1,103	.....	.....	.....	.....	.....	.....
Port Gamble	50	.....	50	.....	.....	.....	.....	.....	.....
Seattle	752	.....	752	.....	.....	.....	.....	.....	.....
Tecoma	225	.....	225	.....	.....	.....	.....	.....	.....
Waitsburg	1,277	.....	1,277	585	.....	585	362	.....	362
Walla Walla	60,809	.....	60,809	6,371	.....	6,371	5,050	.....	5,050
Wallula	200	.....	200	.....	.....	.....	.....	.....	.....
Total	75,138	.....	75,138	7,016	.....	7,016	6,617	.....	6,617

NEW YORK.

New York	.....	$945,355	$945,355	.....	$146,127	$146,127	.....	.....	.....
Total	.....	945,355	945,355	.....	146,127	146,127	.....	.....	.....

MESSENGERS.

Messengers	$94,807	$66,712	$161,519	.....	.....	.....	$1,382	$8,575	$9,957
Total	94,807	66,712	161,519	.....	.....	.....	1,382	8,575	9,957

MEXICO.

Guaymas	$83,110	$100,263	$183,373	$10,499	$15,200	$25,699	$12,001	$23,200	$35,201
La Paz	10,870	543,696	554,566	1,500	46,320	47,820	.....	41,100	41,100
Mazatlan	11,263	614,560	625,823	3,883	78,530	82,413	.....	28,407	28,407
Total	105,243	1,258,519	1,363,762	15,882	140,050	155,932	12,001	92,707	105,308

BRITISH COLUMBIA.

Victoria	$920,260	.....	$920,260	$39,750	.....	$39,750	$37,632	.....	$37,632
Total	920,260	.....	920,260	39,750	.....	39,750	37,632	.....	37,632

TABLE CLXXXIII.—RECAPITULATION OF SHIPMENTS OF BULLION, DUST, AND AMALGAM THROUGH WELLS, FARGO & CO.'S EXPRESS.

UNITED STATES.

State or territory.	Shipments during census year.			Shipments in June, 1879.			Shipments in June, 1880.		
	Gold bullion, dust, and amalgam.	Silver bullion and amalgam.	Total.	Gold bullion, dust, and amalgam.	Silver bullion and amalgam.	Total.	Gold bullion, dust, and amalgam.	Silver bullion and amalgam.	Total.
Arizona	$224,408	$1,402,700	$1,627,108	$17,801	$61,896	$79,697	$11,941	$174,386	$186,327
California	16,829,915	532,286	17,362,201	1,604,716	50,067	1,654,783	1,547,651	29,045	1,576,696
Idaho	1,120,902	631,704	1,752,606	103,182	24,743	127,925	62,071	16,820	78,891
Nevada	107,896	14,113,084	14,280,980	17,695	1,356,530	1,374,225	8,858	901,862	910,720
Oregon	922,381	4,510	926,891	78,002	.....	78,002	59,799	.....	59,799
Utah	773,262	2,237,077	3,010,339	39,222	265,531	304,753	72,702	172,825	245,527
Washington	75,138	.....	75,138	7,016	.....	7,016	6,617	.....	6,617
Total	20,113,902	18,921,361	39,035,323	1,867,634	1,758,767	3,626,401	1,769,639	1,294,938	3,064,577
Messengers	94,807	66,712	161,519	.....	.....	.....	1,382	8,575	9,957
Total	20,208,709	18,988,073	39,196,842	1,867,634	1,758,767	3,626,401	1,771,021	1,303,513	3,074,534
New York	.....	945,355	945,355	.....	146,127	146,127	.....	.....	.....
Total	20,208,709	19,933,428	40,142,197	1,867,634	1,904,894	3,772,528	1,771,021	1,303,513	3,074,534

FOREIGN.

British Columbia	$929,200	.....	$929,200	$39,750	.....	$39,750	$37,632	.....	$37,632
Mexico	105,243	$1,258,519	1,363,762	15,882	$140,050	155,932	12,601	$92,707	105,308
Total	1,034,503	1,258,519	2,293,022	55,632	140,050	195,682	50,233	92,707	142,940
Total United States	20,208,709	19,933,428	40,142,197	1,867,634	1,904,894	3,772,528	1,771,021	1,303,513	3,074,534
Grand total	21,243,272	21,191,947	42,435,219	1,923,266	2,044,944	3,968,210	1,821,254	1,396,220	3,217,474

A statement of the bullion shipments during the census year from offices of Wells, Fargo & Co., at points in the neighborhood of the Comstock lode is annexed, and is followed by a comparison between the outflow in June, 1879, and that in June, 1880:

TABLE CLXXXIV.—BULLION SHIPMENTS FROM POINTS IN NEIGHBORHOOD OF COMSTOCK LODE, THROUGH WELLS, FARGO & CO.'S EXPRESS, FOR THE YEAR ENDING MAY 31, 1880.

County.	Office.	Shipments during census year.			Shipments in June, 1879.			Shipments in June, 1880.		
		Gold bullion, dust, and amalgam.	Silver bullion and amalgam.	Total.	Gold bullion, dust, and amalgam.	Silver bullion and amalgam.	Total.	Gold bullion, dust, and amalgam.	Silver bullion and amalgam.	Total.
Lyon	Dayton	.....	$80,962	$80,962	.....	$22,370	$22,370	.....	.....	.....
Do	Silver City	$29,034	33,092	62,126	$5,430	.....	5,430	$1,480	.....	$1,480
Ormsby	Carson	.....	28,516	28,516	.....	1,600	1,600	.....	$2,822	2,822
Storey	Gold Hill	28,340	22,974	51,314	3,975	10,650	14,625	.....	.....	.....
Do	Virginia City	.....	6,835,712	6,835,712	.....	652,715	652,715	1,500	397,860	399,360
Washoe	Reno	10,080	47,020	57,700	.....	.....	.....	464	.....	464
	Total	67,454	7,054,876	7,122,330	8,805	687,335	696,140	3,444	400,182	403,626

Comparison between bullion shipments in June, 1879, and June, 1880.

	Gold bullion, dust, and amalgam.	Silver bullion and amalgam.	Total.
Shipments in June, 1879	$8,805	$687,335	$696,140
Shipments in June, 1880	3,444	400,182	403,626
Decrease in June, 1880, from June, 1879	5,361	287,153	292,514

The bullion movement from Utah is partially shown in the following abstract from the returns of the Pacific Express Company:

TABLE CLXXXV.—BULLION SHIPMENTS FROM UTAH, THROUGH PACIFIC EXPRESS COMPANY, DURING YEAR ENDING JUNE 30, 1880.

From—	During six months ending December 31, 1879.			Shipped to—								
				New York.			Omaha.			San Francisco.		
	Gold.	Silver.	Total.	Gold.	Silver.	Total.	Gold.	Silver.	Total.	Gold.	Silver.	Total.
Bingham	$107,500	$7,200	$114,700	.....	$7,200	$7,200	.....	.....	.....	$107,500	.....	$107,500
Germania Station	.....	22,630	22,630	.....	.....	.....	.....	.....	.....	.....	$22,630	22,630
Leeds District	.....	468,451	468,451	.....	218,244	218,244	.....	.....	.....	.....	250,207	250,207
Lewiston	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Park City	.....	650,172	650,172	.....	644,747	644,747	.....	$5,425	$5,425	.....	.....	.....
Silver Reef	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tintic District	34,700	1,713	36,413	$34,700	.....	34,700	.....	.....	.....	.....	1,713	1,713
Total	142,200	1,150,166	1,292,366	34,700	870,191	904,891	.....	5,425	5,425	107,500	274,550	382,050

From—	During six months ending June 30, 1880.			Shipped to—						Totals for the year ending June 30, 1880.		
				New York.			San Francisco.					
	Gold.	Silver.	Total.	Gold.	Silver.	Total.	Gold.	Silver.	Total.	Gold.	Silver.	Total.
Bingham	$50,300	.....	$50,300	.....	.....	.....	$50,300	.....	$50,300	$157,800	$7,200	$165,000
Germania Station	.....	$35,340	35,340	.....	.....	.....	.....	$35,340	35,340	.....	57,970	57,970
Leeds District	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	468,451	468,451
Lewiston	.....	8,150	8,150	.....	$8,150	$8,150	.....	.....	.....	.....	8,150	8,150
Park City	.....	468,374	468,374	.....	468,374	468,374	.....	.....	.....	.....	1,118,546	1,118,546
Silver Reef	.....	529,677	529,677	.....	358,089	358,089	.....	171,588	171,588	.....	529,677	529,677
Tintic District	22,953	.....	22,953	$22,953	.....	22,953	.....	.....	.....	57,653	1,713	59,366
Total	73,253	1,041,541	1,114,794	22,953	834,613	857,566	50,300	206,928	257,228	215,453	2,191,707	2,407,160

FOREIGN MOVEMENT.—The exports and imports of treasure are recorded at the custom-houses of the ports through which the outflow and the inflow pass. Such statistics are compiled with great care, and furnish valuable information from a monetary point of view. Used as a means of determining the bullion production of the country they are often deceptive, as explained on a previous page. The figures for the various offices are published regularly by the Bureau of Statistics, and are therefore not repeated here; but an analysis of the returns of the San Francisco custom-house is appended, to show the character of the movement, and as affording a basis of a comparison between similar periods at the beginning and close of the census year.

TABLE CLXXXVI.—TREASURE MOVEMENT THROUGH SAN FRANCISCO CUSTOM-HOUSE.

IMPORTS.

Month.	Gold bullion.	Gold coin.		Total gold.	Silver bullion.	Silver coin.			Total silver.	Total gold and silver.
		Foreign.	Domestic.			Foreign.	Domestic.	Trade dollars.		
June, 1879	$40,252	$205	$3,656	$44,113	$74,477	$254,705	$20,050	.....	$350,132	$394,245
July, 1879	80,862	.....	11,994	92,856	123,698	191,721	20,210	.....	335,629	428,485
August, 1879	127,484	1,700	6,467	135,651	122,878	200,592	17,030	$3,420	343,020	470,571
September, 1879	147,125	4,835	10,689	162,649	101,053	159,380	9,896	.....	270,929	433,578
October, 1879	100,222	620	16,601	117,443	153,374	213,570	13,414	.....	380,367	497,810
November, 1879	237,451	71,240	15,257	323,948	86,211	129,873	12,853	25,015	253,952	577,960
December, 1879	83,921	146,555	8,596	238,072	76,698	345,276	15,467	40,500	477,941	711,013
January, 1880	7,054	115,900	9,900	132,854	83,369	251,322	5,853	.....	340,544	473,398
February, 1880	46,650	15,500	3,929	66,079	238,000	93,781	7,517	15,000	354,298	420,377
March, 1880	37,932	32,412	6,800	77,153	120,084	401,751	28,164	.....	549,999	627,152
April, 1880	.....	21,521	35,883	57,404	135,710	354,695	11,509	.....	501,914	559,318
May, 1880	20,601	.....	40,353	60,954	123,370	132 851	116,388	.....	362,609	423,563
Total	929,554	404,488	170,134	1,504,176	1,439,522	2,719,526	279,251	83,935	4,522,234	6,026,410

TABLE CLXXXVI.—TREASURE MOVEMENT THROUGH SAN FRANCISCO CUSTOM-HOUSE—Continued.

Comparison between treasure imports in June, 1879, and June, 1880.

Month.	Gold bullion.	Gold coin.		Total gold.	Silver bullion.	Silver coin.			Total silver.	Total gold and silver.
		Foreign.	Domestic.			Foreign.	Domestic.	Trade dollars.		
June, 1879	$40,252	$205	$3,656	$44,113	$74,477	$254,705	$20,950	.....	$350,132	$394,245
June, 1880	52,976	.....	27,026	80,002	107,670	180,489	9,119	.....	297,278	378,180
Increase	12,724	.....	24,270	36,789	33,193	.....	.....	.....	.....	.....
Decline	.....	205	.....	.....	.....	74,216	11,831	.....	52,854	16,065

EXPORTS (DOMESTIC).

Month.	(a)Gold bullion.	Gold coin.	Total gold.	Silver bullion.	Silver coin.		Total silver.	Total gold and silver.
					Standard dollars.	Trade dollars.		
June, 1879	$100	$80,343	$80,443	$206,843	.....	$27,888	$234,731	$315,174
July, 1879	1,280	39,360	40,640	155,009	$21,400	7,962	184,371	225,011
August, 1879	3,080	26,788	29,868	804,022	.....	7,390	812,012	841,880
September, 1879	2,645	11,393	14,038	529,838	.....	13,325	543,163	557,201
October, 1879	13,035	40,230	53,865	347,804	240	11,900	359,944	413,809
November, 1879	8,015	53,872	62,487	192,718	.....	1,406	194,124	256,611
December, 1879	8,801	91,800	100,601	1,154,738	1,000	400	1,156,138	1,256,739
January, 1880	.....	11,915	11,915	419,065	500	.....	420,165	432,080
February, 1880	1,307	18,207	19,574	269,125	19,226	1,000	289,351	308,925
March, 1880	286	14,373	14,659	17,700	102,600	.....	120,300	134,959
April, 1880	550	31,042	31,592	72,001	500	.....	72,501	104,093
May, 1880	.....	48,513	48,513	666,299	9,000	.....	675,299	723,812
Total	40,359	467,836	508,195	4,836,362	154,466	71,271	5,062,099	5,570,294

Comparison between treasure exports (domestic) in June, 1879, and June, 1880.

June, 1879	$100	$80,343	$80,443	$206,843	.....	$27,888	$234,731	$315,174
June, 1880	1,020	55,534	56,554	34,452	$21,600	.....	56,052	112,606
Increase	920	.....	.....	.....	21,600	.....	.....	.....
Decline	.....	24,809	23,889	172,391	.....	27,888	178,679	202,568

EXPORTS (FOREIGN RE-EXPORTED).

Month.	Gold bullion.	Gold coin.	Total gold.	Silver bullion.	(b) Silver coin.	Total silver.	Total gold and silver.
June, 1879	.....	.....	.....	$45,600	$65,433	$111,033	$111,033
July, 1879	.....	$1,990	$1,990	13,900	157,490	171,390	173,380
August, 1879	.....	.....	.....	.....	212,421	212,421	212,421
September, 1879	.....	.....	.....	.....	149,308	149,308	149,308
October, 1879	.....	.....	.....	.....	324,730	324,730	324,730
November, 1879	.....	.....	.....	.....	146,205	146,205	146,205
December, 1879	.....	2,452	2,452	.....	251,522	251,522	251,522
January, 1880	.....	.....	.....	.....	140,214	140,214	140,214
February, 1880	.....	.....	.....	.....	325,913	325,913	325,913
March, 1880	.....	.....	.....	.....	205,231	205,231	205,231
April, 1880	.....	.....	.....	.....	110,300	110,300	110,300
May, 1880	.....	.....	.....	.....	487,747	487,747	487,747
Total	.....	4,442	4,442	59,500	2,576,514	2,636,014	2,640,456

Comparison between treasure exports (foreign re-exported) in June, 1879, and June, 1880.

June, 1879	.....	.....	.....	$45,600	$65,433	$111,033	$111,033
July, 1880	.....	.....	.....	.....	102,819	102,819	102,819
Increase	.....	.....	.....	.....	37,386	.....	.....
Decline	.....	.....	.....	45,600	.....	8,214	8,214

a Gold bullion includes gold dust.

b The greater part of the silver coin is Mexican dollars.

FINAL DISPOSITION OF THE PRECIOUS METALS—COINAGE.

The receipts of bullion of domestic production at the United States assay offices, as previously explained, do not indicate the absolute amount of the mine output, but they serve as a useful check in many instances. The following tables are abstracts from the carefully collected statistics of the Treasury Department, selected with reference to their bearing upon the question of production.

TABLE CLXXXVII.—RECEIPTS AT THE MINTS AND UNITED STATES ASSAY OFFICES.

Deposits of gold of domestic production during the fiscal year ended June 30, 1880.

State or territory.	Mints.					Assay offices.				Total.
	Philadelphia.	San Francisco.	Carson.	Denver.	New Orleans.	New York.	Boisé.	Helena.	Charlotte.	
	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.
Alabama	665 94					86 85				752 79
Alaska		5,950 90								5,950 90
Arizona	4,070 85	152,967 26	367 91			1,513 73				158,919 75
California	8,752 54	7,033,656 05	25,389 85		2,350 43	48,667 55				7,118,816 42
Colorado	1,420 30	338 72		344,756 91		1,897,553 72				2,244,069 74
Dakota	971 58	64,350 06				2,684,700 45				2,750,022 09
Georgia	28,023 24					44,733 69			16,174 15	88,931 08
Idaho	4,565 31	365,570 55	1,374 64			20,019 24	116,399 37	1,807 62		510,536 73
Montana	656 41	16,441 84				1,324,982 19		463,687 56		1,805,768 00
Nevada		38,119 81	340,837 45			139,304 59				518,261 85
New Mexico	607 82					90,429 46				91,037 28
North Carolina	14,159 73					14,543 55			50,956 29	85,659 57
Oregon		552,280 41					31,084 93			583,365 34
South Carolina	2,493 26								9,368 44	11,861 70
Tennessee	1,907 95					90 35				1,998 30
Utah	401 22	13,295 30	204 66			13,126 01				27,029 19
Virginia	7,851 24					1,470 83				9,322 07
Washington		34,529 24								34,529 24
Wyoming	11,174 03	328 84		152 95		5,664 28				17,320 70
Refined bullion		18,161,943 52								18,161,943 52
Parted from silver	24,041 43	1,106,868 07				318,615 04				1,449,524 54
Contained in silver							224 86	936 61		1,161 47
Other sources	12,921 26					131,000 74			91 13	144,013 13
Total	125,584 80	27,546,040 57	368,174 51	344,909 86	2,350 43	6,737,404 27	147,619 16	466,431 79	82,590 01	35,821,705 40

Deposits and purchases of silver of domestic production during the fiscal year ended June 30, 1880.

Arizona	121,438 31	831,016 67	12 58			38,855 82				991,323 38
California		283,734 46	19,331 05			781 40				303,846 91
Colorado				4,443 77		1,253,346 64				1,257,790 41
Dakota						21,104 54				21,104 54
Georgia									48 73	48 73
Idaho		88,724 16	24 72			14,152 95	41 29	56 74		102,999 86
Michigan (Lake Superior)	3,230 96					126,455 98				129,686 94
Montana	6,813 52	259,086 30				937,475 44		59,607 06		1,262,982 32
Nevada		4,123,732 53	602,920 00			360,589 65				5,087,242 18
New Mexico						424,967 31				424,967 31
North Carolina									379 18	379 18
Oregon		1,174 26								1,174 26
South Carolina									15 52	15 52
Utah	3,373 41	11,827 38	3 53			612,499 53				627,703 85
Refined bullion		2,970,757 92								2,970,757 92
Parted from gold	22,557 99	78,278 43				118,550 84				219,387 26
Contained in gold							2,011 54	966 69		2,978 23
Other sources	15,440,268 77	1,819,234 48			1,942,936 12	25,928 46			32	18,728,368 15
Total	15,597,682 96	9,967,566 59	622,291 88	4,443 77	1,942,936 12	3,934,708 56	2,052 83	60,630 49	443 75	32,132,756 95

Receipts of gold and silver of domestic production at the mints and United States assay offices during fiscal year ended June 30, 1880.

State or territory.	Gold.	Silver.	Total.
	Dollars.	Dollars.	Dollars.
Alabama	752 70		752 70
Alaska	5,950 00		5,950 90
Arizona	158,019 75	991,323 38	1,150,243 13
California	7,118,816 42	303,846 91	7,422,663 33
Colorado	2,244,060 74	1,257,790 41	3,501,890 15
Dakota	2,750,022 09	21,104 54	2,771,126 63
Georgia	89,831 08	48 73	89,879 81
Idaho	510,546 73	102,999 86	613,546 59
Michigan (Lake Superior)		129,086 94	129,086 04
Montana	1,805,768 00	1,262,982 32	3,068,750 32
Nevada	518,261 85	5,087,242 18	5,605,504 03
New Mexico	91,037 28	424,967 31	516,004 59
North Carolina	85,659 57	379 18	86,038 75
Oregon	583,365 34	1,174 20	584,539 60
South Carolina	11,861 70	15 52	11,877 22
Tennessee	1,998 30		1,998 30
Utah	27,029 19	627,703 85	654,733 04
Virginia	9,322 07		9,322 07
Washington	34,529 24		34,529 24
Wyoming	17,320 70		17,320 70
Refined bullion (gold)	18,161,943 52		18,161,943 52
Refined bullion (silver)		2,970,757 92	2,970,757 92
Parted from silver	1,449,524 54		1,449,524 54
Parted from gold		219,387 26	219,387 26
Contained in silver	1,161 47		1,161 47
Contained in gold		2,978 23	2,978 23
Other sources (gold)	144,013 13		144,013 13
Other sources (silver)		18,728,368 15	18,728,368 15
Total	35,821,705 40	32,132,756 95	67,954,462 35

Gold and silver of domestic production deposited at the mints and assay offices from their organization to the close of the fiscal year ended June 30, 1880.

Alabama	219,872 95		219,872 95
Alaska	29,072 47		29,072 47
Arizona	2,256,742 06	2,116,717 64	4,373,459 70
California	702,058,070 35	1,077,550 45	703,736,520 80
Colorado	35,417,517 54	20,183,889 56	55,601,407 10
Dakota	7,235,112 80	21,121 54	7,256,234 43
Georgia	7,698,082 03	458 20	7,698,540 23
Idaho	24,137,417 11	727,295 50	24,864,712 61
Maryland	402 12		402 12
Massachusetts		917 56	917 56
Michigan (Lake Superior)	123 99	3,433,674 78	3,433,798 77
Montana	48,689,006 09	4,371,384 12	53,060,390 21
Nevada	14,432,322 55	72,107,030 69	86,539,353 24
New Hampshire	11,020 55		11,020 55
New Mexico	1,560,472 14	2,221,484 63	3,790,956 77
North Carolina	10,613,351 10	45,581 33	10,658,932 43
Oregon	15,414,509 57	4,406 38	15,418,915 95
South Carolina	1,401,845 30	30 44	1,401,875 74
Tennessee	84,266 25		84,266 25
Utah	445,133 61	9,036,957 01	9,482,090 62
Vermont	10,981 27		10,981 27
Virginia	1,672,667 70		1,672,667 70
Washington	208,959 37		208,959 37
Wyoming	716,966 47	11,793 86	728,760 33
Refined bullion	201,055,015 26	42,790,012 87	243,845,928 13
Parted from silver	13,974,774 89		13,974,774 89
Contained in silver	9,322,268 97		9,322,268 97
Parted from gold		6,813,478 84	6,813,478 84
Contained in gold		520,623 81	520,623 81
Other sources	10,242,731 33	31,337,203 76	41,579,935 09
Total	1,108,920,405 93	197,421,612 97	1,306,342,018 90

The following table shows the amount of coinage executed during the fiscal year ending June 30, 1880, and the total coinage of the United States up to that date:

TABLE CLXXXVIII.—AMOUNT OF COINAGE EXECUTED DURING FISCAL YEAR ENDING JUNE 30, 1880, AND TOTAL COINAGE OF THE UNITED STATES UP TO THAT DATE.

GOLD COINAGE FOR FISCAL YEAR ENDING JUNE 30, 1880.		SILVER COINAGE FOR FISCAL YEAR ENDING JUNE 30, 1880.		TOTAL COINAGE FOR FISCAL YEAR ENDING JUNE 30, 1880.		TOTAL COINAGE FROM 1793 TO CLOSE OF FISCAL YEAR ENDING JUNE 30, 1880.	
Denomination.	Coinage executed.	Denomination.	Coinage executed.	Metal.	Coinage executed.	Metal.	Coinage executed.
Double-eagles	$21,515,360 00	Dollars	$27,933,750 00	Gold	$56,157,735 00	Gold	$1,133,103,322 00
Eagles	18,836,320 00	Half-dollars	3,275 00	Silver	27,942,437 50	Silver	292,333,436 00
Half-eagles	15,790,860 00	Quarter-dollars	3,837 50				
Three-dollars	9,090 00	Dimes	1,575 00				
Quarter-eagles	3,075 00			Total gold and silver coinage	84,100,172 50	Total gold and silver coinage	1,425,436,758 00
Dollars	3,030 00			Minor coinage	269,971 50	Minor coinage	13,283,167 05
Total	56,157,735 00	Total	27,942,437 50	Total coinage	84,370,144 00	Total coinage	1,438,719,925 05

CONSUMPTION OF THE PRECIOUS METALS IN THE ARTS.

Besides the demand for coinage and export, the precious metals are subjected to a further and constant drain in the large annual consumption in the arts. Until quite recently it was impossible to ascertain the amount so absorbed with any degree of accuracy, though many attempts were made to this end by officials and statisticians. In 1870 estimates furnished by the large gold-refining houses and manufacturing jewelers showed that probably not less than $9,000,000, and possibly over $13,000,000, of gold were used in the arts during that year. Out of this indefinite sum it was impossible to segregate the proportion of bullion of domestic production so consumed from the United States coin, foreign coin and bullion, and old articles remelted for manufacturing purposes.

Latterly fuller and more reliable data are available. A systematic investigation, conducted by the director of the mint, Hon. Horatio C. Burchard, has resulted in tracing this consumption with great accuracy. Records are now kept at the several mints and United States assay offices of the value of bars made and delivered by them for use in the arts and manufacturing. From these returns, supplemented by individual reports from a large proportion of the manufacturing establishments, collected with much care, it is estimated that the amount of gold thus consumed in the United States in the fiscal year ending June 30, 1880, was $10,000,000, and of silver $5,000,000, or $15,000,000 in all. Of this $5,500,000 gold and $4,000,000 silver were of domestic bullion produced during the year, together with $2,500,000 gold and $600,000 silver United States coin. The remainder consisted of old manufactured articles and foreign coin remelted.

This large amount is absorbed mainly in the following principal industries: The manufacture of jewelry, plate, and plated ware, and articles of *vertu;* watch-case, gold pen, instrument, and spectacle making; dentistry; gilding and plating; photography; and to a less extent in glass staining and in various chemical processes. In addition to the leading uses enumerated, there are many others, insignificant individually, but in the aggregate demanding a considerable supply of the precious metals.

Some idea of the relative proportion in which the principal manufacturing industries consume the precious metals may be gathered from the following table, exhibiting the value of the gold and silver used in manufactures and the arts in the United States during the fiscal year ending June 30, 1880, as reported by persons and firms engaged in the manufactures named, in response to circular inquiries addressed from the bureau of the mint:

TABLE CLXXXIX.—COMPARATIVE CONSUMPTION OF THE PRECIOUS METALS IN THE INDUSTRIES AND ARTS.

Manufactures of—	Gold.	Silver.	Total.
Watches and jewelry	$6,517,986	$959,642	$7,477,628
Watch-cases and manufactures	1,202,872	1,817,248	3,020,120
Gold leaf and plate	850,929	606,329	1,457,258
Chemicals	55,410	76,519	131,929
Instruments	6,996	4,432	11,428
Total	8,634,193	3,464,170	12,098,363

OTHER ESTIMATES OF THE BULLION PRODUCT.

As a means of comparison, several independent estimates, derived from different sources of information and compiled upon widely diverse systems, are appended. They are:

1. Estimates of Dr. Adolf Soetbeer (as published in *Petermann's Mittheilungen*, Ergänzungsheft No. 57) of the product of the United States up to the close of 1875; kilograms being converted into troy ounces and German marks into United States money. The conclusions reached by Dr. Soetbeer were based upon an analytical study and comparison of the literature of the subject, and are generally accepted with confidence.

2. Estimates of Hon. Horatio C. Burchard, director of the mint, founded upon the "consumption and export" system, supplemented by circular inquiries among the producers. The director, in his annual report for 1880, states the gross product for that fiscal year in round numbers as $36,000,000 gold, $37,700,000 silver (coinage value), and $73,700,000 total.

3. Estimates of Mr. J. J. Valentine, general superintendent of Wells, Fargo & Co.'s Express, based on the transportation statistics of that and other express companies.

4. Estimates of Dr. Rossiter W. Raymond, formerly United States mining commissioner, for the period covered by his official term.

5. Miscellaneous estimates.

TABLE CXC.—DR. SOETBEER'S ESTIMATE OF THE PRODUCTION OF THE PRECIOUS METALS IN THE UNITED STATES TO THE CLOSE OF 1875.

Periods.	Number of years.	Gold product.			Silver product.		
		Total.	Yearly average.	Value.	Total.	Yearly average.	Value.
		Ounces.	Ounces.	Dollars.	Ounces.	Ounces.	Dollars.
1804–'20	17	1,929	113	39,876			
1821–'30	10	35,368	3,537	731,121			
1831–'40	10	273,295	27,329	5,649,500			
1841–'50	10	5,658,825	565,883	116,978,291			
1851–'55	5	14,275,673	2,855,135	295,104,343	1,334,325	266,865	1,725,149
1856–'60	5	12,304,757	2,478,951	256,222,359	996,725	199,345	1,288,666
1861–'65	5	10,722,832	2,144,566	221,660,603	27,972,602	5,594,520	36,165,777
1866–'70	5	12,217,918	2,443,584	252,566,773	48,389,387	9,677,877	62,562,038
1871–'75	5	9,565,344	1,913,069	197,733,203	90,798,425	18,159,685	117,393,284
Total	72	65,145,941	12,432,107	1,346,678,078	169,491,464	33,898,292	219,135,514

TABLE CXCI.—ESTIMATE OF THE PRODUCTION OF THE PRECIOUS METALS IN THE UNITED STATES FROM 1848 TO 1880, BY FISCAL YEARS.

[From reports of Hon. Horatio C. Burchard, director of the mint.]

Year.	Gold.	Silver.	Total gold and silver.	Year.	Gold.	Silver.	Total gold and silver.	Year.	Gold.	Silver.	Total gold and silver.
	Dollars.	Dollars.	Dollars.		Dollars.	Dollars.	Dollars.		Dollars.	Dollars.	Dollars.
1848...	10,000,000		10,000,000	1860...	46,000,000	150,000	46,150,000	1872...	36,000,000	28,750,000	64,750,000
1849...	40,000,000	50,000	40,050,000	1861...	43,000,000	2,000,000	45,000,000	1873...	36,000,000	35,750,000	71,750,000
1850...	50,000,000	50,000	50,050,000	1862...	39,200,000	4,500,000	43,700,000	1874...	33,490,002	37,324,594	70,815,496
1851...	55,000,000	50,000	55,050,000	1863...	40,000,000	8,500,000	48,500,000	1875...	33,467,856	31,727,560	65,195,416
1852...	60,000,000	50,000	60,050,000	1864...	46,000,000	11,000,000	57,000,000	1876...	39,929,166	38,783,016	78,712,182
1853...	65,000,000	50,000	65,050,000	1865...	53,225,000	11,250,000	64,475,000	1877...	46,897,390	39,793,573	86,690,963
1854...	60,000,000	50,000	60,050,000	1866...	53,500,000	10,000,000	63,500,000	1878...	51,206,360	45,281,385	96,487,745
1855...	55,000,000	50,000	55,050,000	1867...	51,725,000	13,500,000	65,225,000	1879...	38,899,858	40,812,132	79,711,990
1856...	55,000,000	50,000	55,050,000	1868...	48,000,000	12,000,000	60,000,000	1880...	36,000,000	37,700,000	73,700,000
1857...	55,000,000	50,000	55,050,000	1869...	49,500,000	12,000,000	61,500,000	Total.	1,520,041,552	460,422,260	1,980,463,792
1858...	50,000,000	50,000	50,050,000	1870...	50,000,000	16,000,000	66,000,000				
1859...	50,000,000	100,000	50,100,000	1871...	43,000,000	23,000,000	66,000,000				

TABLE CXCII.—BULLION PRODUCTION OF THE UNITED STATES FOR THE YEAR ENDING JUNE 30, 1879.

[Estimated by Hon. Horatio C. Burchard, director of the mint.]

State or territory.	Gold.	Silver.	Total.
Arizona	$800,000	$3,550,000	$4,350,000
California	17,600,000	2,400,000	20,000,000
Colorado	3,225,000	11,700,000	14,925,000
Dakota	2,420,000	10,000	2,430,000
Georgia	90,000		90,000
Idaho	1,200,000	650,000	1,850,000
Michigan (Lake Superior) (a)		780,000	780,000
Montana	2,500,000	2,225,000	4,725,000
Nevada	9,000,000	12,560,000	21,560,000
New Mexico	125,000	600,000	725,000
North Carolina	90,000		90,000
Oregon	1,150,000	20,000	1,170,000
Utah	575,000	6,250,000	6,825,000
Washington	75,000	20,000	95,000
Other sources	50,000	47,000	97,000
Total	38,900,000	40,812,000	79,712,000

a Including bullion from Silver Islet, which is in Canada.

TABLE CXCIII.—STATEMENT OF THE AMOUNT OF PRECIOUS METALS PRODUCED IN THE

[Estimated by Mr. John J. Valentine, general

	State or territory.	Gold dust and bullion by express.				Gold dust and bullion by other conveyances.			
		1879.	1880.	Increase.	Decrease.	1879.	1880.	Increase.	Decrease.
		Dollars.	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*
1	California	16, 348, 730	16, 900, 745	552, 015		817, 436	845, 000	27, 564	
2	Nevada	168, 847	236, 323	67, 476					
3	Oregon	943, 601	692, 525		251, 076	94, 360	346, 262	251, 902	
4	Washington	77, 579	68, 911		8, 668	7, 757	34, 500	26, 743	
5	Idaho	1, 035, 804	1, 175, 115	139, 311		207, 160	235, 023	27, 863	
6	Montana	1, 907, 053	1, 115, 787		791, 266	95, 352	55, 789		39, 563
7	Utah	211, 640	95, 958		115, 682	21, 164	10, 336		10, 828
8	Colorado	3, 144, 607	2, 278, 899		865, 708	314, 469			314, 469
9	New Mexico	19, 800	27, 300	7, 500					
10	Arizona	212, 722	159, 970		52, 752	21, 272	80, 000	58, 728	
11	Dakota	2, 674, 150	3, 749, 081	1, 074, 925		534, 831	374, 000		160, 831
	Total	26, 744, 629	26, 500, 704	1, 841, 227	2, 085, 152	2, 113, 801	1, 980, 910	392, 800	525, 691
	Increase								
	Decrease				243, 925				132, 891

TABLE CXCIV.—STATEMENT OF THE AMOUNT OF PRECIOUS METALS PRODUCED IN

[Estimated by Mr. John J. Valentine, general

	Country.	Gold dust and bullion by express.				Gold dust and bullion by other conveyances.			
		1879.	1880.	Increase.	Decrease.	1879.	1880.	Increase.	Decrease.
		Dollars.	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*
1	Mexico (west coast)	92, 916	118, 248	25, 332					
2	British Columbia	976, 742	675, 894		300, 848		168, 973	168, 973	
	Total	1, 069, 658	794, 142	25, 332	300, 848		168, 973	168, 973	
	Increase							168, 973	
	Decrease				275, 516				

STATES AND TERRITORIES WEST OF THE 100TH MERIDIAN FOR THE YEARS 1879 AND 1880.

superintendent, Wells, Fargo & Co.'s Express.]

Silver bullion by express.				Ores and base bullion by freight.				Total.				
1879.	1880.	Increase.	Decrease.	1879.	1880.	Increase.	Decrease.	1879.	1880.	Increase.	Decrease.	
Dollars.	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	
739,440	378,567	.....	360,873	285,307	151,854	.....	133,513	18,190,973	18,276,166	85,193	.....	1
16,622,472	11,071,992	.....	5,550,480	5,206,395	3,723,306	.....	1,483,089	21,997,714	15,031,621	.....	6,966,093	2
.....	20,854	20,854	.....	.....	.....	.....	.....	1,037,961	1,059,641	21,680	.....	3
.....	1,753	1,753	.....	.....	.....	.....	.....	85,336	105,164	19,828	.....	4
578,336	332,755	.....	245,581	270,000	151,854	.....	118,146	2,091,300	1,894,747	.....	196,553	5
1,194,389	919,189	.....	275,200	432,226	1,731,614	1,299,388	.....	3,629,020	3,822,379	193,359	.....	6
2,559,042	3,076,775	517,733	.....	2,077,033	3,207,884	590,851	.....	5,468,879	6,450,953	982,074	.....	7
1,594,349	1,706,000	111,651	.....	9,360,000	17,300,000	7,940,000	.....	14,413,515	21,284,989	6,871,474	.....	8
603,000	684,000	81,000	.....	.....	.....	.....	.....	622,800	711,300	88,500	.....	9
1,046,036	2,830,449	1,784,413	.....	662,373	1,402,052	739,679	.....	1,942,403	4,472,471	2,530,068	.....	10
.....	.....	.....	.....	.....	.....	.....	.....	3,208,987	4,121,081	914,094	.....	11
24,937,064	21,022,334	2,517,404	6,432,134	18,893,394	27,728,564	10,569,918	1,734,748	72,088,288	77,292,512	11,706,270	7,162,046	
.....	.....	.....	.....	.....	.....	8,835,170	.....	.....	.....	4,543,624	.....	
.....	.....	.....	3,914,730	.....	.....	.....	.....	.....	.....	.....	.....	

MEXICO (WEST COAST) AND BRITISH COLUMBIA FOR THE YEARS 1879 AND 1880.

superintendent, Wells, Fargo & Co.'s Express.]

Silver bullion by express.				Ores and base bullion by freight.				Total.				
1879.	1880.	Increase.	Decrease.	1879.	1880.	Increase.	Decrease.	1879.	1880.	Increase.	Decrease.	
Dollars.	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	
1,249,955	1,586,309	336,354	.....	341,000	386,000	45,000	.....	1,683,871	2,090,557	406,686	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	976,742	844,867	.....	131,875	2
1,249,955	1,586,309	336,354	.....	341,000	386,000	45,000	.....	2,660,613	2,935,424	406,686	131,875	
.....	.....	336,354	.....	.....	.....	45,000	.....	.....	.....	274,811	.....	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	

TABLE CXCV.—ANNUAL PRODUCTS OF LEAD, SILVER, AND GOLD IN THE STATES AND TERRITORIES WEST OF THE 100TH MERIDIAN, 1870–1880.

[Estimated by Mr. John J. Valentine, general superintendent, Wells, Fargo & Co.'s Express.]

Year.	Products as per W., F. & Co.'s statements, including amounts from British Columbia and west coast of Mexico.	Product after deducting amounts from British Columbia and west coast of Mexico.	The net product of the states and territories west of the 100th meridian exclusive of British Columbia and west coast of Mexico, divided as follows—			
			Lead.	Copper.	Silver.	Gold.
	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.
1870	54, 000, 000	52, 150, 000	1, 080, 000	.....	17, 320, 000	33, 750, 000
1871	58, 284, 000	55, 784, 000	2, 100, 000	.....	19, 286, 000	34, 398, 000
1872	62, 236, 959	60, 351, 824	2, 250, 000	.....	19, 924, 429	38, 177, 395
1873	72, 258, 693	70, 139, 860	3, 450, 000	.....	27, 483, 302	39, 206, 558
1874	74, 401, 045	71, 965, 610	3, 800, 000	.....	29, 600, 122	38, 466, 488
1875	80, 889, 057	76, 703, 433	5, 100, 000	.....	31, 635, 230	39, 968, 104
1876	90, 875, 173	87, 219, 859	5, 040, 000	.....	39, 292, 024	42, 886, 035
1877	98, 421, 754	95, 811, 582	5, 085, 250	.....	45, 846, 109	44, 880, 223
1878	81, 154, 622	78, 276, 167	3, 452, 000	.....	37, 248, 137	37, 576, 030
1879	75, 349, 501	72, 688, 888	4, 185, 769	.....	37, 032, 857	31, 470, 262
1880	80, 167, 936	77, 232, 512	5, 742, 390	898, 000	38, 033, 055	32, 559, 067

TABLE CXCVI.—BULLION PRODUCTION OF THE UNITED STATES FROM 1868 TO 1875.

[Estimated by Dr. Rossiter W. Raymond, United States mining commissioner.]

State or territory.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.
	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.
California	22, 000, 000	22, 500, 000	25, 000, 000	20, 000, 000	19, 049, 098	18, 025, 722	20, 300, 531	17, 753, 151
Nevada	14, 000, 000	14, 000, 000	16, 000, 000	22, 500, 000	25, 548, 801	35, 254, 507	35, 452, 233	40, 478, 369
Montana	15, 000, 000	9, 000, 000	9, 100, 000	8, 050, 000	6, 008, 339	5, 187, 047	3, 844, 722	3, 573, 000
Idaho	7, 000, 000	7, 000, 000	6, 000, 000	5, 000, 000	2, 695, 870	2, 500, 000	1, 880, 004	1, 750, 000
Oregon and Washington	4, 000, 000	3, 000, 000	3, 000, 000	2, 500, 000	2, 000, 000	1, 585, 784	763, 605	1, 246, 978
Arizona	500, 000	1, 000, 000	800, 000	800, 000	625, 000	500, 000	487, 000	750, 000
New Mexico	250, 000	500, 000	500, 000	500, 000	500, 000	500, 000	500, 000	325, 000
Colorado and Wyoming	3, 250, 000	4, 000, 000	3, 775, 000	4, 763, 000	4, 761, 465	4, 070, 263	5, 188, 510	5, 302, 810
Utah	.....	.....	1, 300, 000	2, 300, 000	2, 445, 284	3, 778, 200	3, 011, 601	3, 137, 688
From other parts	1, 000, 000	500, 000	525, 000	250, 000	250, 000	250, 000	100, 000	500, 000
Total	67, 000, 000	61, 500, 000	66, 000, 000	66, 663, 000	69, 943, 857	71, 651, 523	72, 428, 206	74, 817, 596

TABLE CXCVII.—GOLD PRODUCTION OF THE SOUTHERN STATES FROM 1804 TO 1850.

[Estimates of Professor J. D. Whitney.] Metallic Wealth U.S., Phila., 1854, p. 207

Value of gold production by states.

Georgia	$6, 048, 900
North Carolina	6, 842, 900
South Carolina	818, 100
Tennessee and Alabama	263, 800
Virginia	1, 198, 600
Total	15, 172, 300

Value of gold production in the respective divisions of time.

1804–'23	$47, 000
1824–'30	715, 000
1831–'40	6, 695, 000
1841–'50	7, 715, 300
Total	15, 172, 300

TABLE CXCVIII.—EXPORTS OF GOLD FROM SAN FRANCISCO FROM 1848 TO 1863.

[With estimates of Mr. W. P. Blake.]

Year.	Declared gold export.	Estimated actual gold export.	Year.	Declared gold export.	Estimated actual gold export.
1848	$65, 000, 000	$10, 000, 000	1857	$48, 976, 692	$55, 000, 000
1849		40, 000, 000	1858	47, 548, 020	50, 000, 000
1850		50, 000, 000	1859	47, 640, 462	50, 000, 000
1851 up to May 1	11, 497, 000		1860	42, 325, 016	42, 325, 016
1851	34, 960, 895	55, 000, 000	1861	40, 676, 758	39, 176, 758
1852	45, 779, 000	60, 000, 000	1862	42, 561, 761	36, 061, 761
1853	54, 965, 000	65, 000, 000	1863	46, 071, 020	33, 071, 020
1854	52, 045, 033	60, 000, 000	Total	676, 908, 228	755, 036, 355
1855	45, 161, 731	55, 000, 000			
1856	50, 607, 434	55, 000, 000			

TABLE CXCIX.—MR. A. DEL MAR'S ESTIMATE OF THE SILVER PRODUCTION FROM 1871 TO 1876.

District.	1871.		1872.		1873.		1874.		1875.		1876.	
	Gold product.	Silver product.	Gold product.	Silver product.	Gold product.	Silver product.	Gold product.	Silver product.	Gold product.	Silver product.	Gold product.	Silver product.
	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.
Comstock lode	4,077,427	6,230,587	6,310,035	6,612,943	10,493,756	11,037,020	12,579,825	11,881,000	11,739,873	14,492,350	18,002,906	20,570,078
Other mines in Nevada	1,485,007	7,880,764	2,142,730	9,953,634	2,678,469	8,094,440	1,650,202	3,521,382	2,256,618	6,717,636	1,337,798	7,462,752
Whole of Nevada	5,562,434	14,111,351	8,452,765	16,566,577	13,172,225	19,131,460	14,230,027	15,402,382	13,996,491	21,209,986	19,340,704	28,032,830
Remainder of the United States	....	4,000,000	....	2,000,000	....	6,000,000	....	10,000,000	....	9,000,000	....	10,151,520
Entire silver product	....	18,111,351	....	18,566,577	....	25,131,460	....	25,402,382	....	30,209,986	....	38,184,350

The silver product in the United States (with the exception of Nevada) is given for 1876 *as follows:*

Arizona	$500,000
California	1,800,000
Colorado	3,000,000
Idaho	300,000
Montana	800,000
New Mexico	400,000
Utah	3,351,520
Total, about	10,151,520

BULLION PRODUCT OF THE WORLD.

The world's annual output, so far as ascertainable, is shown in the following tables, which state the sources according to political divisions, and also by continents. The data are for calendar years except for the United States, British Columbia, and Japan. Accurate statistics of the small production of gold and silver in Central America, that of silver in Canada, and gold in Nova Scotia are not available. The totals given are probably slightly under the actual amount. A comparison of the individual figures shows that the United States produce 33.13 per cent. of the gold yield of the whole world, 50.54 per cent. of the silver, and 40.91 per cent. of the total. Of the aggregate supply of the precious metals, North America (including the United States, Mexico, and British Columbia) furnishes 55.78 per cent.

TABLE CC.—ANNUAL BULLION PRODUCT OF THE WORLD.

Political distribution.

Country.	Gold.	Silver.	Total.
	Dollars.	Dollars.	Dollars.
United States (a)	33,379,663	41,110,957	74,490,620
Mexico	989,161	25,167,763	26,156,924
British Columbia (b)	910,804	....	910,804
Africa (c)	1,993,800	....	1,993,800
Argentine Republic	78,546	420,225	498,771
Colombia	4,000,000	1,000,000	5,000,000
Rest of South America (c)	1,993,800	1,089,100	3,032,990
Australia (d)	29,018,223	....	29,018,223
Austria	1,062,031	2,002,727	3,064,758
Germany (d)	205,361	6,938,073	7,143,434
Norway	....	166,270	166,270
Italy (d)	72,375	17,949	90,324
Russia (d)	26,584,000	415,676	26,999,676
Sweden	1,994	62,435	64,429
Rest of Europe	....	2,078,380	2,078,380
Japan	466,548	916,400	1,382,948
Total	100,756,306	81,336,045	182,092,351

Continental distribution.

Continent.	Total bullion product.	Percentage of total product.
	Dollars.	Per cent.
North America	101,558,348	55.78
Africa	1,993,800	1.10
Australia	29,018,223	15.93
Europe, including Russia in Asia	39,607,271	21.75
Japan	1,382,948	0.76
South America	8,531,761	4.68
Total	182,092,351	100.00

a Census of 1880. *b* Actual export. *c* From Dr. Soetbeer's estimate in 1875. *d* Estimated from production of other years.

17,883,761
191,444,35
10,391,190
11,384,990
…48,045
…444,351
For corrections, see Report of Director of Mint, 1885.

CHAPTER VIII.—THE MINTING OF GOLD AND SILVER.

BY ALBERT WILLIAMS, JR.

A description of the means by which gold and silver are refined and made into coin forms a natural sequence to the description of the mining and metallurgical methods given in previous chapters. The following pages are designed to present merely a brief outline of the subject for the benefit of readers who may be unfamiliar with it. An exhaustive treatise on modern practice is much to be desired, but such a dissertation does not come within the scope of this volume. Two mints were selected for examination, that at Carson, Nevada, and that at San Francisco, California. The processes employed at these two establishments are in the main identical, though conducted upon an altogether different scale; and to avoid wearisome repetition of details the description of the system at the San Francisco mint is confined, so far as practicable, to the salient divergencies from the methods pursued at the smaller mint. Both mints now part by sulphuric acid, the nitric-acid process (formerly in exclusive use at the San Francisco mint) having been in large part supplanted by the cheaper sulphuric-acid process. In each case the officers extended every facility for inspection, and to them, and to all the employés, the writer is indebted for many courtesies.

UNITED STATES MINT AT CARSON, ORMSBY COUNTY, NEVADA.

The Carson mint, though much smaller and having far less working capacity than the similar establishments at San Francisco and Philadelphia, is nevertheless a fully-equipped mint, capable of meeting all ordinary requirements, and performs its work in an excellent manner. It was projected with the view of facilitating the minting of bullion from the Comstock mines, but for reasons unconnected with the simple question of proximity the greater part of the Comstock product has been treated at the San Francisco mint. The Carson mint having but slight, if any, advantages over its San Francisco rival in point of transportation from other mining districts, has, therefore, except during exceptional periods of activity, been limited in its operations to even less than its actual capacity, and at times has been shut down for months. This was the case during a large part of the census year. The examination was made in January, 1881.

LOCATION AND RAILROAD CONNECTIONS.—The site of the mint comprises a block on the west side of C street, Carson, one block south from the station of the Virginia and Truckee railroad. The mines of the Comstock and neighboring groups are distant from 20 to 25 miles, while the mills along the Carson river are at nearer intervals. From Virginia City to Carson by rail the distance is 21.1 miles. At Reno, 31.1 miles distant by rail from Carson, the Virginia and Truckee railroad connects with the Central Pacific railroad, thus bringing the mint into communication with the mining districts within reach of the latter road.

THE BUILDING.—The main building, designed by Mr. A. B. Mullett, then supervising architect of the Treasury Department, was completed in January, 1870, at a total cost of $160,000. It consists of two stories and a basement, the first floor being 15 feet high and the second story 14 feet. The area covered is 90 feet 6 inches by 59 feet 10 inches. The basement contains the annealing-room, cutting-room, grinding-room, hydraulic presses, drying furnaces, Chili mills, vaults, storerooms, and closets, and through it run the counter-shafts, with the pulleys driving the machinery on the first floor. The engine and boiler rooms are immediately in the rear and on the basement level. On the first floor are the weighing-room, deposit-melting and ingot-melting furnaces, ingot rolls, whitening-room, coining presses, machine-shop, offices of the cashier, coiner, and melter and refiner, and vaults. The second story is occupied by the superintendent's, assayer's, and chief clerk's offices, the laboratory, assay-room, humid assay-room, refinery, and adjusting rooms.

The walls are a rough-dressed freestone from the quarry of the Nevada state penitentiary, 1½ miles distant—a handsome building-stone, which is said to become indurated by exposure. Granite quarried 3½ miles from the site is used for the stairs. The shutters are of iron.

An extension in the rear of the main building, of the same general construction and appearance as the latter, and designed to contain the refinery (which was hampered for want of room in its original position), was unfinished at the date of examination. The first appropriation of $8,500 having been exhausted, a further sum of $5,000 would be required to complete this extension. There are five vaults in the main building provided with combination locks.

MACHINERY, ETC.—The machinery, appliances, and fittings, which will be described somewhat in detail, are of recent type throughout, and are well adapted to their several purposes. Their total cost, including alterations and repairs, is stated to have been, in round numbers, $100,000.

COST.—The total cost of construction and equipment of the mint, inclusive of the additional appropriation required, was:

Main building	$160,000
Extension	8,500
To complete extension	5,000
Machinery, fittings, etc	100,000
Total	273,500

This may be assumed as representing the cost of a first-class mint of moderate capacity.

ORGANIZATION.—The work of the mint is, for convenience and as a precaution against loss or error, divided among four distinct departments, which are designated as: *a*, The general department, under the immediate and special charge of the superintendent; *b*, the assayer's department; *c*, the melter and refiner; and, *d*, the coiner. These form separate corps, working independently, but accounting to each other. Over the whole the superintendent has, of course, supervision.

MINT TERMS.—Gold bullion and dust are deposited and returns made to the depositors in coin after minting, the gold coinage being free. Silver bullion is purchased at the market price, governed by the daily London quotations, with allowance for variation in exchange. The bullion purchased is 0.500 fine and over, at the discretion of the superintendent.

IMPROVEMENTS NEEDED.—Although the Carson mint has been described as a complete one, there are still a few slight improvements which might be advantageously added. Among these are:

a. A reverberatory cupel furnace, for treating bullion containing a large proportion of lead. At present the mint is carrying over from year to year bars which cannot be termed base, but which cannot be profitably refined by the sulphuric-acid process. As an average example of this class of bullion, the assay determination of bar No. 92, cast in 1879, is appended: Gold, 0.021; silver, 0.535; lead, 0.444.

b. Dust-chambers or condensing-flues connected with the main stack. Although the loss of precious metal is small, it could be still further reduced by these means.

c. Improved sulphuric acid condensers in the refinery.

In describing the operations of the mint in detail the natural sequence of the several manipulations will be observed, so far as is practicable, beginning with the receipt of the precious metals in their crude state, and then following them through the processes of melting, refining into mint-fine metal, alloying to the coin standard, casting the coin-metal into ingots, rolling the ingots to the required thickness, annealing, cutting into planchettes, adjusting to proper weight, milling, whitening, and finally minting into standard coin. Besides these processes, the checks against loss, the driving power, the amount of work done, value of supplies consumed, and labor expended, with subsidiary details, will also be considered.

WEIGHING-ROOM.—The gold deposits, silver purchases, and retorted amalgam are here received and weighed in the crude state. The weights, in connection with the assay of samples from the deposit-melting room, form a basis for action by the superintendent. This room is on the first floor, at the left of the main entrance, and is in charge of the weigh clerk and assistant weigh clerk, who form the total force. It is included in the general department, which is responsible for all bullion until the latter is formally transmitted to the melter and refiner and accepted by him in the ingot-melting room.

Scales.—The weighing is done on a large pair of Troemner bullion scales, made expressly for the mint. Their capacity is from 0.01 ounce to 6,000 ounces. The center knife-edge is chilled steel on agate bearings, and the knife-edges at each end of the beam are agate on agate. There are no beam riders. Adjustment for wear and tear is secured by filing or removing rings of copper wire, which are hung on pendants.

DEPOSIT-MELTING ROOM.—From the weighing room the crude bullion goes to the deposit-melting room, where it is melted and samples are taken for the assayer. This room is on the first floor at the middle of the south side of the main building, is 18 feet 3 inches by 14 feet 10 inches in size, and is in charge of the deposit melter and his assistant. It is included in the superintendent's special department.

Furnaces.—There are three melting furnaces in the room of the same general type. Two of these have heavy cast-iron shells, frames, and doors, and are lined with fire-brick; they are 18 inches square, inside measurement, 16 inches deep in front, and 30 inches deep at the back, with level grates. The iron sliding doors at the top are sharply inclined, sloping downward from the back. The flue from each is 7 by 9 inches, and leads to the main stack. The smaller furnace is similar in construction, but has a sheet-iron shell. It is 13 inches square, 16 inches deep in front, and 27 inches deep in the rear, and its flue, 5 by 6 inches, leads to a separate small chimney. The grate-bars of each furnace are 1 inch wide, with spaces of five-eighths of an inch intervening.

Fuel.—If several melts are to be made in succession, Lehigh anthracite and nut-pine charcoal mixed are used. For a single melt the fire is made of charcoal only.

Crucibles.—Graphite, French clay, and sand crucibles are used. The series of sizes of graphite crucibles employed includes Nos. 8, 12, 20, 35, 90, 100, and 150. With bullion of the average fineness received, the working capacity of each size is as follows, the weight of the crude charge, exclusive of flux, being given:

	Ounces.
No. 8 crucible	200
No. 12 crucible	250 to 300
No. 20 crucible	400
No. 35 crucible	1,300
No. 90 crucible	2,000 to 2,500
No. 100 crucible	3,500
No. 150 crucible	6,000

These figures are for charges conveniently melted in crucibles of the respective sizes, and do not represent the extreme holding capacity. It should also be observed that the several working capacities are not in direct ratio with the series of designating numbers. The life of graphite crucibles varies from fifteen to twenty melts, according to the character of the bullion treated. If there is much lead in the bullion, the crucibles are more rapidly corroded than if an equivalent percentage of other base metal were present. The stirrers are of the same material as the crucibles—graphite and clay mixed.

Sand crucibles of small size are employed for melting assay grains belonging to each deposit or purchase and are broken after having been once used.

The French crucibles are second-hand ones from the assay department, and are used, merely as a matter of economy, for the same purpose as the sand crucibles. Like the latter, they are destroyed after one firing.

Loss of weight in melting.—With fairly clean bars the loss of weight ranges from five to fourteen one-hundredths of one per cent., and with well-retorted amalgam the loss is from one-half of one per cent. to one per cent.

Fluxes.—The fluxes added to the charge of crude bullion in the melting pots are:

a. Borax, invariably.

b. Sodium bicarbonate, if retorted amalgam is being melted.

c. Potassium nitrate, if iron or carbonaceous matter is present in the bullion.

d. Bone-ash, to thicken the slag so that it may be easily skimmed off.

e. Phosphorus, in quantities not exceeding one-half ounce to a melt of 1,800 ounces, in case the bullion contains much copper.

f. Corrosive sublimate, with bullion containing much lead or antimony.

With fine bars the surface of the melt is protected from the air and volatilization of silver prevented, should the melt become overheated, by sprinkling upon it powdered charcoal sifted through a No. 60 screen.

Molds.—The crude metal sent from the deposit-melting room to the refinery is cast into bars of a peculiar shape, termed "shoe-bars". The shoe-bar mold is a parallelogram slightly contracted at each end and having two transverse ribs or semi partitions, which rise to a little more than one-half the thickness of the metal cast, thus producing a bar which is deeply indented transversely in two places and can readily be broken into three nearly equal portions, for convenience and greater rapidity in dissolving. The molds are 15 inches long, 3½ inches wide at the center, and 1¾ inches deep (interior dimensions). With bullion containing 40 per cent. in value of gold, the shoe-bars average 200 ounces in weight. The range is from 170 to 220 ounces.

Smaller rectangular molds are used for casting assay bars and small quantities of bullion.

Sampling.—The deposit melter takes two samples of each gold deposit or silver purchase. With gold deposits diagonal corner chips are taken from the bar, the chips together weighing forty one-hundredths of an ounce. If the gold melt is large, making several shoe-bars, a pair of diagonal corner chips are taken from the first and from the last bar of the melt.

With small melts of silver or doré metal two dips are taken directly from the melting pot and granulated, the two granulation samples weighing from twenty to sixty one-hundredths of an ounce. In case of large melts of silver or doré metal granulations are taken from the top and the bottom of the charge by dipping 200 ounces from the melting pot, pouring off all but a few ounces from the dipping cup, and granulating 1½ ounces in cold water. The pair of granulation samples sent to the assayer weigh from twenty to sixty one-hundredths of an ounce.

In each instance a careful system of designating the samples and stamping the corresponding bars is observed, so that the assay determinations in connection with the weights give exact data for the guidance of the superintendent and the melter and refiner.

MELTER AND REFINER'S DEPARTMENT.

The crude bullion, after having been cast into shoe-bars and sampled, is transferred to the melter and refiner's department. From this point the melter and refiner is responsible for all bullion received by him until, after refining and casting into ingots of standard coin metal, it has been transmitted to the coiner's department.

The total force employed in the melter and refiner's department is nine men, including the following officers: melter and refiner, assistant melter and refiner, computing clerk, foreman of the ingot-melting room, and foreman of the refinery.

REFINERY.—The refinery occupies two rooms, 47 feet 4 inches by 23 feet 1½ inches, and 26 feet 10 inches by 18 feet 5 inches in size, on the west side and at the northwest corner of the second story. It is intended to transfer the refinery to the extension when the latter shall have been completed. The force employed is three, consisting of the foreman and two helpers. The work done consists in the following operations: *a*, Parting of gold from silver in doré metal by boiling with sulphuric acid; *b*, "sweetening" the parted gold; *c*, precipitation of silver from the acid solution of argentic sulphate by metallic copper; *d*, "sweetening" the precipitated silver; *e*, disposal of the cupric sulphate solution formed during the process of precipitation; *f*, as an adjunct operation, the manufacture of "silver-cake"; that is, compressed silver precipitate.

First boiling with sulphuric acid.—This is done over four heating furnaces, arranged in two pairs. These are of common brick, lined with fire-brick. The fuel used is yellow pine, in sticks 4 feet long. There are four parting kettles, made of cast iron, 3 feet diameter at the top, 30 inches deep, $\frac{7}{10}$ inch thick at the upper part, and 1¼ inches thick at the bottom. The additional thickness below compensates for the greater exposure there, so that the wastage of iron is uniform. The covers of the parting kettles are also of cast iron, and are conical. They are half an inch thick, and are hung by chains from pulleys and counterpoised.

An essential point in the use of the sulphuric-acid process is that the unparted bars should be of the proper tenor, which by long continued observation is found to be a fineness of from 0.070 to 0.075 in gold, to give the best results in parting. The unparted bullion treated at this mint is very irregular in character, the range being from 0.002 to 0.500 fine in gold. Bullion lately received contained only from 0.002 to 0.020 fine in gold. With this low proportion of gold the latter, on the solution of the doré metal, forms a fine, impalpable powder, which floats on the surface of the acid in the kettle and cannot be perfectly separated from the silver. This defect is corrected by adding gold in the previous melting. Unparted bullion 0.900 fine (in gold and silver) dissolves readily in the shoe-bar shape with or without breaking the bar into its three sections. These bars weigh, as previously stated, from 170 to 220 ounces each. It was formerly the custom when treating Comstock bullion, which, because of its fineness (usually above 0.990), volatilized perceptibly in melting, to protect it by adding a small quantity of very base bullion. Five pounds of lead bullion, containing also some iron, were added per charge. This practice, introduced by the melter and refiner, is said to have worked well. Latterly, however, it has been unnecessary, as the bullion treated has been of lower grade.

The usual charge of unparted bullion is 2,500 ounces to each kettle. The proportion of acid is 4 pounds of sulphuric acid to 1 pound of unparted bullion. One-half of the acid, *i. e.*, 2 pounds to each pound of bullion, is placed in the kettle on charging, and the remainder is added gradually in pitchersful as the silver is taken up. The normal strength of the acid is 62° Baumé, but if the unparted bullion contains much copper a slightly weaker acid is used. The temperature maintained is 650° F., the boiling point of acid of the normal strength. The time occupied in boiling is five hours. At the expiration of this period the fire is drawn and the charge is allowed to cool and settle for two hours. This interval is requisite for an additional reason, namely, that the operator may not suffer from the sulphurous acid fumes.

The method of discharging the kettles is as follows: As much of the parted gold as possible is first ladled out from the bottom; the acid solution of argentic sulphate is then siphoned off, and finally the remainder of the parted gold is removed.

Second boiling of the parted gold.—A further purification of the parted gold is next attained by reboiling it with sulphuric acid in smaller kettles over special furnaces. There are three of these heating furnaces of the same type and dimensions. They have heavy cast-iron shells of octagonal shape externally and are lined with fire-brick. The interior is vertically cylindrical, and is 10 inches in diameter and 15 inches deep. The fuel used is nut pine charcoal. The three reboiling kettles resemble those employed in the first boiling, but are only 20 inches in diameter at the top and 16 inches deep. The acid is of the same strength, and the time occupied in reboiling is two and a half hours.

"Sweetening" the parted gold after the second boiling.—This consists in repeatedly washing the gold with hot water (not distilled) in a filtering tub. There are six of these filtering vessels. Two are porcelain jars made in Germany, and cost $60 each. They are 20 inches in diameter and 24 inches deep. Four small wooden tubs, lined with sheet lead, are also used; but the porcelain jars are preferable, even at the increased cost, being free from the inconvenience caused by the incrustation of crystallized sulphates, which forms on the interior surfaces of the lead-lined wooden tubs. Porcelain, however, although undoubtedly the best material, appears to have the property, in a very small degree, of reducing silver from the acid solution of argentic sulphate—a point which is undesirable at this stage of the process. This is probably due to the solubility of the glaze of the jars, though the organic matter of the filter may also have the same effect. The straining material is unbleached muslin sheeting. The old filters are burned, the ashes being preserved and returned with the annual clean-up of the mint.

Third boiling and washing of the parted gold.—On the day following the second boiling with sulphuric acid and washing with hot water, the parted gold is subjected to a third boiling with acid and additional washings. The manipulations are a simple repetition of those just described. The gold is now in a state of almost absolute purity.

Avoidance of brittle gold.—Most refineries in which the method of parting by sulphuric acid is adopted produce brittle gold; that is, gold which cannot be rolled safely, and which requires careful annealing before passing the breaking-down rolls, and perhaps may not be sufficiently ductile even after annealing. Much trouble has been experienced at the San Francisco mint from this cause. The presence of the most minute quantity of lead impairs the ductility of gold, but does not affect silver in nearly the same degree. Lead is with difficulty removed when the parting of gold from silver is done by sulphuric acid. To entirely eliminate the lead which may be present a very simple and efficacious expedient has been hit upon, which consists in taking advantage of the difference in specific gravity between gold and lead and the minute subdivision of the particles of the latter. The filtering vessel in which the parted gold is washed with hot water is slightly inclined by the operator, and the lead particles are floated off with the washings into another tub. This plan of simple decantation succeeds so well that at the Carson mint the gold ingots do not require to be annealed before going to the breaking-down rolls.

Disposition of the parted and sweetened gold.—It is dried (without furnace heat) and sent directly to the ingot-melting room. There it is fed into the melting pots very carefully, to avoid loss by sputtering. Where large quantities are treated it is desirable to have the parted and sweetened gold pressed into cakes and dried in a furnace before melting, as is done with the silver at this mint and with both gold and silver at the San Francisco mint. After melting the metal is sampled and cast into bars. It is then known as "mint-fine" gold; that is, gold as near absolute purity as is necessary in the subsequent processes.

Precipitation of silver from the acid solution of argentic sulphate by metallic copper.—In the parting of the gold from the silver of the doré metal the silver is attacked by the acid and appears as a sulphate held in a solution which also contains free sulphuric acid. Besides this solution, there are also the wash-water of decantation and the filtrates formed in sweetening the parted gold. These contain considerable argentic sulphate, and are concentrated by evaporation before reduction. The next step in the process is the recovery of the silver in a metallic state from the acid solution of argentic sulphate. This is effected by precipitation on metallic copper, in four large wooden vats, rectangular in shape and lined with sheet lead. To prevent the escape of the fumes generated during the heating of the liquor the vats are inclosed in vertically-sliding wooden partitions, hung by chains from the ceiling and counterpoised, so that any portion of the interior is readily accessible for inspection or for any of the necessary manipulations. The vats are each 2 feet deep (interior measurement), and the other dimensions are from 6 by 11 to 9 by 12 feet. Laid around the bottom, on the inside of each vat, are three coils of leaden steam-pipes, 2 inches in diameter, fed by live steam from the engine boilers, by which the solution is kept heated to about 180° F. The maintenance of a precise temperature does not appear to be essential to successful precipitation, and any near approximation to the point mentioned is found in practice to be sufficient.

The copper used is from the Lake Superior mines, and is refined at Baltimore, Maryland. Its fineness is something remarkable, being, by assays at the mint, no less than 0.9997, the 0.0003 of impurity remaining being chiefly iron. The form in which the copper has hitherto been employed has been the ordinary 20-pound ingot of commerce as received from the copper-refining works. The melter and refiner, however, has had molds prepared and forwarded to Baltimore for casting the copper in thin slabs, 6 by 12 by 1 inches, with the object of securing a larger precipitating surface in proportion to the weight of metal used, and also with a view to increased convenience in removing the precipitated silver. The charge of copper ingots is 1,000 pounds to each vat. They are laid across the coils of steam-pipes at intervals of 8 inches. The slabs are intended to be placed on the bottom, forming a loose pavement, and also upright along the sides and ends of the vats.

In charging the precipitating vats, after arranging the copper ingots in position, undistilled cold water is poured in through pipes to a depth of from 12 to 14 inches. The acid solution of argentic sulphate is then added, bringing the contents to within about 3 inches of the top of the vat. With the system pursued at this mint the resulting dilution is about 18° Baumé, which is considered the most advantageous strength. After charging, steam is turned on through the leaden coils, and the liquor becomes gradually heated to the desired temperature. The time required for complete precipitation is twenty-four hours of constant heating; but as the mint is ordinarily working during one shift of eight hours only, three days are consumed in this part of the process.

The method of determining whether complete precipitation has been effected is as follows: A small quantity of the acid solution is drawn off, cooled, and poured into a test-tube. A solution of sodium chloride (strength immaterial) is added. A white precipitate of argentic chloride indicates incomplete reduction; but if all the silver has been reduced, no precipitate occurs. These tests are applied from time to time by the operator, and show the progress of the precipitation.

To remove the precipitated silver from the surfaces of the copper ingots the latter are scraped twice a day with long-handled wooden spatulas. No especial care is taken to remove by itself all the silver recovered from each separate charge, as ultimately all is saved, and there is no necessity for segregating the results of each operation. Indeed, to attempt to do so would be to entail much additional labor, resulting in insignificant advantages, as the system of dividing the responsibility and accountability serves as an effectual check upon loss or error from this source.

The copper ingots last about two weeks, the gradual wastage being made good by the addition of fresh quantities of copper. Each residual ingot averages 8 ounces in weight. Thus the whole of the original charge

of copper placed in a vat at any one time may be assumed (disregarding the fresh ingots added) to have been diminished in weight from 1,000 to 25 pounds; and the average amount of copper converted into cupric sulphate being taken as 19 pounds 8 ounces for each ingot, the whole amount of copper of the original charge thus converted into sulphate is 975 pounds, or 97½ per cent. The residual copper, now in the form of small irregular nuggets, is washed upon removal from the vat to detach any adhering silver, and is sent to the ingot-melting room, to be used in alloying the mint-fine gold and silver to the standard coin fineness.

Sweetening the precipitated silver.—This operation is analogous to the method of purifying the parted gold, and consists in repeatedly washing with hot water the precipitated silver collected from the faces of the copper ingots. The mountain water from the mint service-pipes is very pure, and contains no chlorides. Were the latter present, they would necessitate a distillation of the water to prevent the formation of argentic chloride. There are four wooden filtering vats lined with sheet-lead. The internal measurements are: Diameter at top, 28 inches; diameter at bottom, 24 inches; depth, 24 inches. The filters are of unbleached muslin sheeting. When old, they are burned, and the ashes are returned with the sweepings, etc., at the close of the fiscal year.

Disposition of the cupric sulphate solution.—As the precipitation of metallic silver upon the copper ingots proceeds sulphate of copper is formed, replacing the sulphate of silver in the solution. After all the silver has been thrown down, the solution of cupric sulphate is siphoned out from the precipitating vats and is drawn through leaden pipes into a lead-lined tank outside the building, whence it is removed by the contractors. It is used by the Lyon Mill and Mining Company at their works at Dayton in the amalgamation of tailings. The contract strength is 20° Baumé, and the price paid in the census year was at the rate of 17 cents per pound for each pound of copper used in the mint refinery.

Prevention of loss of precious metal in the refinery.—The floor is covered with sheet lead throughout and is mopped several times every day. Whenever a portion of any solution is spilled, it is at once wiped up. The mop-cloths are finally burned, and the ashes are returned with the general clean-up of the mint at the close of the fiscal year. All savings of this kind are credited, according to assay, to the melter and refiner in making up the annual accounts. The savings also include slags, sweepings, furnace-ashes, flue-dust, burned filters, old cupels, broken crucibles and stirrers, etc.

Manufacture of silver-cake.—The wet and loose silver, after sweetening, is squeezed into consistent shape by powerful hydraulic presses, and is then dried in a special furnace. Two of these presses are used. The pressure exerted is 40 tons to the whole area of the plunger face. The plunger is 12 inches in diameter, and the collar, which fits closely on the plunger, is 12 inches deep. The weight of a single pressed cake before drying is 1,100 to 1,200 ounces, and its volume is about one-quarter of that of the unpressed charge.

Drying the pressed silver-cake.—One drying furnace is used. It is 34 inches wide, 13 inches high, and 8 feet long, and has a flat roof. The lining is of fire-brick, and the frames and doors are of cast iron. The grate area is 2 by 8 feet, and the grate-bars are 1 inch wide and five-eighths of an inch apart. The fuel used is yellow pine, in 4-foot sticks. The cakes are charged in pans, supported by six longitudinal bars, 1¼ inches wide, with intervening spaces of 3⅝ inches. When completely dried, but not fused, the cakes are sent to the ingot-melting room and melted. The product is then known as mint-fine silver.

THE INGOT-MELTING ROOM.—This room is on the first floor at the rear, adjoining the rolling-room, and is 23 feet 1½ inches by 22 feet 8 inches in size. It belongs to the melter and refiner's department, and is in charge of a foreman, with three helpers. The length of shift is eight hours. The work done here is: *a*, Melting the silver-cake and the sweetened gold separately into mint-fine metal; *b*, preparation of standard coin alloy and remelting of clippings from the cutting room; *c*, casting the alloy and the remelt into ingots; and *d*, cleaning the ingots and dressing them into shape.

In this room there are five furnaces, all alike. They have heavy cast-iron shells, lined with fire-brick, and are 16 by 16½ inches in area, 17½ inches deep in front, and 20 inches deep in rear, measured from the grate to the bottom of the flue. The flues are 6 by 8 inches, and lead to the main stack. The doors are of cast iron, steeply inclined toward the front. Lehigh anthracite is used as fuel. The crucibles and stirrers are of graphite and clay mixed, the sizes of crucibles used being Nos. 45, 60, and 90. No. 12 Dixon crucibles are employed for dipping cups. The flux is borax, and sometimes also niter, sal ammoniac, bone-ash, and powdered charcoal. A melt of silver usually consists of from 5,000 to 6,000 ounces, but a melt of gold is smaller, and is variable.

System of sampling mint-fine silver.—A cupful of about 200 ounces is taken from the top of the melt. Of this quantity all but 5 or 6 ounces is poured back into the crucible, and the remainder is cast into a small assay bar, stamped with the assay number of the melt, and also numbered "1", to indicate that it is the top sample. When the large pot is nearly empty this process is repeated, and a second assay bar is obtained, which is stamped as before, but numbered "2", to denote that it is the bottom sample.

System of sampling mint-fine gold.—A similar method is practiced with gold, except that the assay bars cast are 10 ounces in weight.

Molds.—The molds are of clamped cast-iron, and for gold the series consists of one size each for double-eagle, eagle, half-eagle, and quarter-eagle ingots. Quarter-eagles are not coined at this mint, though the necessary molds, dies, etc., are on hand. For silver ingots three sizes of molds are used: one for quarters, one for halves,

and one for dimes and standard or trade dollars. The dollar mold produces ingots from which strips for punching a double row of dimes are rolled. The total stock embraced 135 ingot molds, as follows: Double-eagle, 6; eagle, 10; half-eagle, 10; quarter-eagle, 10; dollar and dime, 36; half-dollar, 36; quarter-dollar, 27. The duration of the molds is indefinite. They are said to become better as they grow older.

The ingots are cooled and cleaned by being plunged into a bath of cold water, slightly acidulated with sulphuric acid, in the proportion of 5 ounces of the commercial acid to 25 gallons of water.

Manufacture of standard gold ingots.—On the report of the assayer as to the fineness of the samples of mint-fine gold (which average 0.997 gold and 0.003 silver) the melter and refiner bases his computation as to the amount of copper required to reduce a given weight of mint-fine gold to the coin standard. The law prescribes that the proportion of copper shall not be less than 0.090. After placing into the crucible the proper amounts of gold and copper, clippings from the cutting-room may be added to complete the charge. The average weight of gold-ingot melts is 3,000 ounces. In sampling the coin ingots a center chip is taken from the heads of the first and last ingots of the melt, and from the assays of these samples the assayer certifies to the alloy being of the proper proportions.

Manufacture of standard silver ingots.—The calculation for copper is similarly based on the assayer's report as to the fineness of the mint-fine silver. The proper amounts of silver and copper having been placed in the crucible, the charge may be filled out with clippings from standard silver strips, as in the case of the gold melts. The average weight of the silver-ingot melt is 1,800 ounces. Granulations are taken from the top and bottom of each melt, the two samples together weighing about 0.30 ounce.

Legal tolerance.—The legal tolerance is the slight variation allowed by the law from the absolute standard. For gold this margin is 0.0015 each way from the standard; that is, the coin may contain from 0.8985 to 0.9015 gold. For silver the allowance is 0.003 each way from the standard, or, in other words, the coin may legally vary from 0.897 to 0.903 in silver.

Actual working tolerance.—The mint regulations prescribe much greater accuracy than is required by the law. In mint practice the gold ingots are not allowed to vary more than 0.0005 from the standard, and the silver ingots are kept within a range of 0.0015. Thus the gold ingots actually only vary from 0.8995 to 0.9005, and the silver from 0.8985 to 0.9015 in fine metal.

Liquation of silver in standard ingots.—In cooling there is a partial segregation of silver toward the center of the ingot, which results in making the center richer than the edges. It is found that the central portion of a rolled strip of standard silver prepared from such an ingot (the molecules during the rolling process maintaining the same relative positions to each other laterally that they had in the ingot) may sometimes be from 0.0005 to 0.001 finer than the edges of the same strip. This variation differs with the character of the strips; that is, for which sized coin they are intended. The planchettes are therefore slightly finer than the clippings, the greater bulk of the latter being from the edges of the strip, while the planchettes contain proportionally more of the central part. A slight allowance has sometimes been made to offset this irregularity. The alloy of gold and copper does not act in the same way, being more stable, and if there is a similar liquation it is in an imperceptible degree.

Dressing the ingots.—The ends of the ingots are squared by a clipping machine, the invention of the late John A. Eckfelt, of the San Francisco mint. This is a very compact and convenient machine, consisting of a vertically-sliding steel jaw in combination with a fixed steel lower jaw, the driving machinery being inclosed in an upright frame or post. The ingots are then clamped in a vise and the rough edges dressed down by a 14-inch bastard file. After trimming, the ingots are sent to the rolling-room. The standard silver ingots weigh from 48 to 50 ounces each. The gold ingots for eagles weigh 69 ounces, and those for half-eagles 44 ounces.

The floor of the ingot-melting room is covered by hexagonal cast-iron gratings, easily removable when the room is swept. Wherever practicable, as for pails, tongs, etc., the utensils here used are of copper. Iron discolors the silver ingots.

A settlement of the standard ingots is made weekly. Bullion is received in the melter and refiner's department on the 1st and 15th of each month. All bullion is reweighed on receipt, in addition to the tally made by the melter and refiner or his assistant, when it is weighed out and delivered by the weigh clerk.

COINER'S DEPARTMENT.

ROLLING-ROOM.—The ingots of standard coin metal, prepared in the melter and refiner's department, are next taken to the rolling-room, where they are rolled into strips of approximately the proper thickness, as a preparatory step toward punching out the planchettes. This room is on the west side of the first floor, adjoining the ingot-melting room, and is in charge of the roller. The force here employed is three men.

Rolls.—Two pairs of heavy rolls, made of chilled cast steel, are used. One pair, called the breaking-down rolls, first reduce the ingots roughly; the second pair then still further reduce the thickness. The draw-bench in the cutting-room is also fitted with smaller finishing rolls. The rolling-machines were made in Philadelphia; one pair of the heavy rolls were furnished by the Krupp steel works at Essen, Rhenish Prussia, and the others were made in Pittsburgh. The rolls of American make are found to be perfectly satisfactory. Those in the rolling-room

each have a face 10 inches long, and are 8 inches in diameter. The trunnions are cast solid with the roller portion, and are 12 inches long and 6 inches in diameter. The journal-boxes are of brass, the lower half being provided with two gibs of babbitt-metal about 90° apart, each 1½ inches face, and extending the full length of the bearing surface. When new, these babbitt strips project very slightly above the brass face. The rolls are driven at a speed of seventy-eight to eighty revolutions per minute. The limit of play is five-eighths of an inch, and the adjustment is effected by screw hand-wheels. A clock-gauge indicates the distance between the roll-faces with great precision.

Power.—The power required to drive a single pair of rolls varies from 8 to 40 horse-power, depending upon the character of the work done. When first breaking down the fresh ingots the 30 horse-power 10-inch belts often slip, although they are carried on leather-faced band-wheels. In the final rolling much less power is required. Each roll has its own pulley, the upper and the lower roll being thus driven independently at the same speed in opposite directions. The band-wheels are 5 feet in diameter, with 10 inches face, and weigh 250 pounds each. They are faced with leather, which is riveted on.

Rolling.—An ingot for making standard dollars is 12½ inches long, 1½ inches wide, and $\frac{7}{16}$ inch thick before passing through the breaking-down rolls. It is reduced in thickness to nearly that of the coin, and is drawn out to a length of 3 feet 1 inch; but the increase of width in the finished strip, as compared with that of the ingot, is almost imperceptible, although it is perfectly free to expand laterally. The strips are rolled and re-rolled as often as may be necessary until they assume the proper thinness. To prevent any flexure of the strips the rolls are provided on the discharge side with loose, flat, hopper-shaped guides, an improvement designed by the machinist of this mint. Only lateral guides are attached to the feed-side of the machines.

Testing the thickness of the rolled strips.—A power cutting-press, similar to those in the cutting-room, is used as a test-punch. It is fitted with adjustable dies and collars for the different sizes of planchettes, and with it trial planchettes are struck from the strips as the rolling progresses. These are tested on a small pair of Troemner scales in the room. The roller is allowed a margin of 0.06 per cent. in excess of the standard weight, but of course must not roll the strips too thin.

Shearing the rolled strips.—For convenience in subsequent work the long strips are each cut into two equal lengths. This is done by a shearing-machine, which consists in a movable upper and a fixed lower jaw of chilled steel. The jaws are 4 inches long, and have an extreme bite of three-quarters of an inch at the outer end.

ANNEALING ROOM.—After having been sheared, the strips are taken to the annealing room, which is in the basement, adjoining the cutting-room, and is in charge of the annealer and his assistant. The work here done is to anneal the strips of gold and silver standard coin metal after their preliminary reduction by the large rolls and preparatory to their finishing treatment on the draw-bench of the cutting-room. The object is to prevent any brittleness in the metal, which would seriously interfere with the subsequent operations, particularly that of coining.

Furnaces.—There are two annealing furnaces of the same size and character. They have heavy cast-iron frames and doors, and are lined with Santa Cruz fire-brick. The doors are 12½ inches wide and 11 inches high. The fire-chamber is 18 inches high, and the grate area is 14 inches by 5 feet 8 inches. The grate bars are arranged across the furnace hearth, and are 1½ inches wide, with 1-inch spaces. Split yellow pine, in 4-foot sticks, is used as fuel. When the mint is running steadily the furnaces are used daily, and consume 1½ cords per week.

Annealing canisters.—The strips are protected by cylindrical copper tubes, capable of holding several strips each. These canisters are closed at one end and fitted at the other with copper covers, which are luted on with fire-clay. For gold strips they are 3 feet 6 inches long, 4½ inches internal diameter, and $\frac{3}{16}$ inch thick, and for silver strips 3 feet 2 inches long, 4¼ inches internal diameter, and $\frac{3}{16}$ inch thick. Two canisters are charged in a furnace together, and are heated a dull red for 40 minutes. The length of exposure to the heat is the same, whether the strips are gold or silver. The average life of the canisters when in constant use is two months; there are twenty-seven in stock.

Cooling the heated strips.—On removal from the furnace the strips are gradually cooled in warm water. This is done in two annealing vats, made of wood and lined with sheet copper and provided with hinged wooden covers, also copper-lined. They are rectangular in shape, 4 feet 6 inches long, 18 inches deep, and 2 feet wide. Steam-pipes rest upon the bottoms of the vats, through which live steam from the engine boilers passes, raising the temperature of the water (before the introduction of the strips) to 180° F. The time occupied in cooling the strips to below the boiling point is ten minutes, making the whole duration of the annealing process fifty minutes.

CUTTING-ROOM.—After annealing, the strips are transferred to the cutting-room. This room is at the southeast corner of the basement, adjoining the annealing-room, is 16 feet square, and is in charge of the cutter. The total force is three men. The work done here is: *a*, The final dressing of the rolled strips by stubbing their ends and reducing them to standard thickness on a draw-bench; *b*, cutting and weighing trial planchettes; and, *c*, cutting out the planchettes for coining.

Stubbing.—This consists in pinching one end of each strip so that it can be fed through the rolls of the draw-bench and be seized by the dogs or clutches of that machine. The stubbing apparatus consists of a pair of small chilled steel rolls, 3⅛ inches diameter and 2¾ inches face, the upper roll being a plain cylinder, but the lower a cylinder of the same shape, except that its periphery is beveled with four flat facets, each 1⅛ inches wide. These stubbing-rolls are adjusted by hand-screws to regulate the distance between the faces according to the character

of the strip operated on; that is, whether it is intended for dollars, for halves, or for other coins. The length of the stubbed portion of a strip is 2 inches. The strips are "doped" before treatment, the silver ones by dipping in tallow and the gold ones by being beeswaxed.

Drawing the stubbed strips.—The draw-bench is similar in principle to those used in wire works, but is designed for flat drawing. It has two small adjustable steel rolls, set vertically and revolving freely in opposite directions. The stubbed end of the strip is fed by hand between these rolls, when it is seized on the discharge side of the rolls by the draw-dogs and pulled through. The dogs are clamped by a treadle, worked by the operator. The draw-bench thus completes the rolling of the strips which the large rolls of the rolling-room began.

Punching the planchettes.—Two cutting-presses are used. These are of similar size and pattern, and run at the rate of two hundred and eighty strokes per minute while cutting, but there is a loss of time in feeding the successive strips. Power is applied by means of eccentrics on a counter-shaft under the presses. The feed is by hand, and is regulated by a fixed gauge. Double dies, the invention of the coiner, Levi Dague, are used in cutting out the dime planchettes. They punch two planchettes, side by side, from the strip at a single stroke. A considerable saving in time is effected in this way; but for larger coins it would be impracticable to use double dies, unless with very powerful machinery.

Testing the planchettes.—A trial blank is taken from the middle and from each end of every third strip, and is tested on a pair of Troemner assay scales by the cutter's weigher. The power required in the cutting-room is about 10 horse-power.

The planchettes form about 60 per cent. of the original weight of the strips, the remainder being clippings. These clippings, as already stated, are returned to the ingot-melting room, and are there used in filling up the crucibles in which the standard alloys are melted. The planchettes themselves are washed in hot water with potash and soap, dried in pans, and then sent to the adjusting rooms.

ADJUSTING ROOMS.—Adjusting consists in filing the planchettes sent from the cutting-presses, if necessary, so that they are brought to the standard weight or within the limit of working tolerance. This work is done by eight women under the supervision of a forewoman. Each adjuster has a small pair of Troemner scales, upon which the planchettes are tested. If a planchette is found to weigh more than the working tolerance allows, it is filed on the edge by rolling it between the thumb and fingers lengthwise over a 10-inch bastard file, thus reducing its circumference uniformly. If its weight is already within the prescribed limits, it is passed without adjusting; if too light, it is condemned. The legal tolerance in weight is: for double-eagles and eagles, ½ grain; for half- and quarter-eagles, ¼ grain; for standard dollars, 1½ grains. The work is kept well within these limits. Each gold planchette, after adjusting, is reweighed separately by the forewoman, and all the adjusted pieces are again weighed, by drafts, in the coiner's office. After leaving the adjusting rooms and being checked in the coiner's office the planchettes are milled in the press-room, rechecked, and sent to the whitening-room.

WHITENING-ROOM.—This is on the first floor, at the middle of the north end of the building. The manipulations conducted here consist in: *a*, Cleansing the milled planchettes (at this stage called "blanks") in a hot alkaline bath; *b*, rinsing with hot water; *c*, heating; *d*, immersion in acidulated bath; *e*, rinsing in cold water; *f*, partial drying in riddles with sawdust; *g*, final drying in closed pans. For convenience and for economy of fuel these operations are performed only every other day, except when the mint is running at full capacity.

Washing the blanks in the alkaline bath.—The vessel used is a stout copper pan, 30 inches in diameter at the top and 9 inches deep. The charge is 1,000 blanks of the dollar size, or a corresponding amount of blanks for other denominations. Both gold and silver are treated alike at this stage. The bath is a strong hot-water suds of soda and bar soap, and its object is to remove the grease. The time occupied in this washing is about five minutes for each draft of blanks.

Rinsing after the alkaline wash.—The rinsing vat is a wooden tub, 30 inches in diameter and 18 inches deep, lined with sheet lead and having a protecting rim and a partial lining of sheet copper at the top. In this the blanks are thoroughly rinsed with undistilled boiling water.

Heating the blanks.—At the next stage of the process the blanks, after having been washed in the alkaline bath and rinsed, are heated to a cherry red in suitable furnaces. There are two of these furnaces, each 2 feet square, made of common brick and lined with fire-brick. The frames and doors are of cast iron. The fuel is yellow pine. The silver blanks are charged in open earthenware pans, and are exposed to the heat for fifteen minutes. Gold blanks are charged in rectangular cast-iron canisters hermetically closed and luted with potters' clay, and are heated twenty minutes.

Pickling the heated blanks.—The heated blanks are next subjected to an acidulated hot bath. For gold blanks this is a pickle composed of 4 ounces of commercial nitric acid to 16 gallons of undistilled water, and for silver blanks the bath contains from 4½ to 5 ounces of sulphuric acid (62° Baumé) to 16 gallons of water. The pickling process occupies five minutes. A single tub is used for both the nitric acid and the sulphuric acid baths. It is 30 inches in diameter and 16 inches deep, and is of unprotected wood. It is proposed to substitute a lead-lined wooden vat for the sulphuric acid pickle. The object of pickling the blanks is to remove oxidation and discoloration due to the canister copper, and, in effect, a slight proportion of the copper of the alloy is removed from the faces of the blanks, thus brightening the surface of the coin. The loss of metal in this process is 0.05 ounce in 1,000 ounces of gold blanks and 0.10 ounce in 1,000 ounces of silver blanks.

Rinsing after pickling.—The blanks are now rinsed with undistilled cold water in a plain wooden tub, 18 inches deep and 30 inches in diameter.

Partial drying with sawdust.—After rinsing, the blanks are placed in a coarse copper riddle and are partially dried by being shaken with sawdust. For this purpose basswood sawdust, brought from Philadelphia, is employed.

Final drying in closed pans.—The drying chambers are of wood, rectangular in shape, 33 inches by 6 feet, and 10 inches deep, and provided with loosely fitting flat covers. They are lined throughout, covers included, with sheet copper, and are heated to 180° F. by means of a steam coil fed with live steam from the engine boilers and arranged under each pan. In fifteen minutes the blanks are thoroughly dry and are now ready for coining.

PRESS-ROOM.—The room containing the milling machines and coining presses is on the first floor at the northeast corner. Here the adjusted planchettes are milled into blanks, and the blanks (after whitening) are made into coin. The blanks are fed to the machines and presses by women.

Milling machines.—These turn up the edges of the blanks, making them perfectly true. Three are in use: One for standard and trade dollars, requiring one horse-power each; one for subsidiary silver coins, requiring half a horse-power; and one for gold coins, requiring one horse-power.

Coining presses.—No. 1 coins double-eagles, standard dollars, and trade dollars. This model is said to be the most powerful coining press in existence, and is known as the Ajax. The one in the Carson mint was exhibited at the Philadelphia exposition. Its pressure is rated at 152 tons, but employés of the San Francisco mint rate the pressure of the Ajax type at 200 tons. The working speed is from 85 to 98 pieces per minute. The power required is only 5 horse-power, and the adjustment is so perfect that a coin may be struck by simply turning the fly-wheel by hand.

No. 2 press is of medium size, and is designed for coining eagles, half-eagles, standard and trade dollars, halves, or dimes. It strikes 95 pieces per minute at the usual working speed, and requires nearly 5 horse-power.

No. 3, the smallest press, is intended for coining quarter-eagles, quarter-dollars, and dimes, but is not in use, as the mint does not make these denominations. Its capacity is 140 pieces per minute, and it requires 2 horse-power.

The total press capacity of the mint is one-third in excess of that of the preparatory appliances. Their arches are of the best Scotch pig cast iron, that of the Ajax weighing over 7,000 pounds, that of No. 2 press over 5,000 pounds, and the arch of No. 3 about 3,500 pounds. The levers are of brass. The original arch of No. 2 cracked on the line of a bolt hole while coining standard dollars and was replaced by a casting 1½ inches thicker. All the presses run with beautiful smoothness.

A 10-inch emery wheel, ¾-inch face, is used to dress the bottoms of the dies evenly. It is driven at a speed of eight hundred revolutions per minute by a rubber friction roller in contact with the fly-wheel of the small coining press.

SIZE AND WEIGHT OF UNITED STATES GOLD AND SILVER COINS.

Denomination.	SIZE.		WEIGHT.	
	Diameter, in twentieths of an inch.	Thickness, in thousandths of an inch.	Grains.	Troy ounces.
Double-eagle	27	0.077	516	1.075
Eagle	21	0.060	258	0.5375
Half-eagle	17	0.046	129	0.26875
Quarter-eagle	14	0.034	64½	0.134375
Standard dollar	30	0.082	412½	0.859375
Trade dollar	30	0.082	420	0.8750
Half-dollar	24	0.057	192.9	0.401875
Quarter-dollar	19	0.045	96.45	0.200937
Dime	14	0.052	38.58	0.080375
Half-dime	12	0.023	19.29	0.0401875

The specific gravity of United States gold coins of 0.900 fine standard is 17.165.

ASSAYER'S DEPARTMENT.

The assayer's department is on the second floor, at the south end of the main building, and extends from the front to the rear. It comprises five rooms—office, laboratory, fire-assay room, volumetric test-room, and charcoal storeroom. The force consists of the assayer, assistant assayer, humid assayer, cupeller and dissolver, and clerk.

Assay scales.—Two fine Oertling balances, costing $350 each, are in use. The working delicacy of these scales is $\frac{1}{10}$ milligram, but by subdividing the beam-rider spaces a delicacy of $\frac{1}{40}$ milligram is attainable.

Sampling.—The system of sampling the bullion in the deposit-melting room has already been described. In sampling the assay bars of mint-fine metal from the ingot-melting room the practice is as follows: For gold, one inside chip, averaging 0.35 ounce in weight, is taken from each of the 10-ounce top and bottom assay bars (which have been stamped "1" and "2" respectively); for silver, one inside chip, averaging also 0.35 ounce, is taken from each 6- or 8-ounce assay bar.

System of assaying.—It is hardly necessary for the purposes of this chapter to enter into details familiar to most readers. The fire assay is used: *a*, In testing purchases and deposits; *b*, mint-fine gold; *c*, standard gold ingots; and occasionally, *d*, as a check upon the humid or volumetric method.

The volumetric system of Gay-Lussac (precipitation by a normal solution of sodium chloride) is employed with (*a*) mint-fine silver and (*b*) standard silver ingots. As applied at the Carson mint, the humid method gives $\frac{1}{10}$ of 0.001 in fineness, and the assayer's reports are in tenths of thousandths. The readings in the volumetric test-room are compared against a black screen, which is hung in front of the window.

Apparatus and machines.—The assay plant includes:

A muffle furnace in the fire-assay room. It has a soapstone front and three muffle doors.

An ore-assay furnace in the same room, 13 by 13 inches, and similar to the small furnace in the deposit-melting room. This furnace holds six assay crucibles.

Sand bath in the same room.

A condensing apparatus, consisting of a steam-coil condenser, having a capacity of 100 gallons in eight hours. As before stated, the water supplied to the mint is very pure, being from mountain streams. It contains hardly a trace of chlorine, but has a little lime, and for ordinary purposes does not need to be distilled. The main use of the condenser is to supply water for the humid assay of silver.

Two pairs of small power rolls made of chilled cast steel, one of which is used in rolling assay lead and the other for gold and silver. These are alike, and are 2½ inches in diameter and 4 inches face.

A shaking machine for agitating the precipitating bottles used in the humid assay. It holds twelve precipitating bottles. The vibrations are vertical and extend 2½ inches, and the speed is two hundred and forty strokes per minute. This machine is driven by a rawhide band from a 4-horse power engine.

MISCELLANEOUS.

LOSS OF PRECIOUS METALS.—*Flue-dust.*—The main stack of the mint is of common brick, 80 feet high, and has a single plain flue, which is circular in cross-section and 4 feet diameter. The addition of dust-chambers would effect a saving which would undoubtedly cover their expense. At the foot of the stack is a man-way, for access in cleaning, provided with an iron door. It has been the custom to clean out the flue at the close of each fiscal year. In 1880 no such clean-up was made, as the mint had been executing comparatively little work. The stack clean-up in June, 1879, produced 2 ounces of fine gold and 80 ounces of fine silver. This was less than the average for the preceding years. The amount of gold and silver which actually escapes through the stack cannot be accurately determined.

Loss in melting and refining.—The greater part of the total loss occurs in these operations. Each particle of metal is melted at least three times, exclusive of the clippings, which undergo a constant cycle of manipulations, so that it is possible to conceive of certain particles being remelted indefinitely. At each melting there is a small loss by volatilization, which it is endeavored to avoid by covering the surface of the melt with powdered charcoal.

The legal tolerance of wastage is 1½ ounces of silver in every 1,000 ounces of fine metal treated and 1 ounce of gold in each 1,000 ounces of fine gold handled. The actual loss in the melter and refiner's department, as compared with the legal allowance on the quantity of bullion refined, is shown in the following table, from which it appears that the working results have been kept well within the authorized limits:

LOSSES OF GOLD AND SILVER IN MELTING AND REFINING AT THE CARSON MINT.

Period.	GOLD.		SILVER.	
	Legal tolerance.	Actual loss.	Legal tolerance.	Actual loss.
	Ounces.	*Ounces.*	*Ounces.*	*Ounces.*
Fiscal year ending June 30, 1878	90	18	6,000	700
Fiscal year ending June 30, 1879	39	33	4,500	330
Fiscal year ending June 30, 1880	35	6	1,304	135

The total wastage during the fiscal year ending June 30, 1880, at this mint was as follows:

Melter and refiner's gold wastage	$124 50
Coiner's gold wastage	45 51
Melter and refiner's silver wastage	157 47
Coiner's silver wastage	149 18
Total	476 66

MOTIVE POWER.—*Boilers.*—The boiler-room is on the ground floor of the extension, in the rear of the main building. There are two horizontal, plain flue boilers, each 16 feet long and 54 inches in diameter, and having 52 flues 3½ inches in diameter. The total grate area is 38 square feet, the grate being 9 feet 6 inches across the front of

the pair of boilers and 4 feet deep. The grate bars are 8 inches wide, 4 feet long, and three-quarters of an inch thick, and are stiffened with vertical ribs 6 inches deep. The bars run lengthwise with the boilers, and are perforated with holes half an inch square at the top and five-eighths of an inch square at the under surface, these openings being arranged in rows of three lines of holes half an inch apart and 2 inches between each set of three lines. The fuel is yellow pine, in 4-foot sticks, and the consumption of wood is 1½ cords per eight-hour shift. Feed-water is supplied at 180° F. The pressure averages 70 pounds. Steam is sent from these boilers to the main engine and the small engine and condensing apparatus in the assay department, and is also used in the refinery for heating the precipitating vats in the whitening and annealing rooms and for various purposes.

Engines.—The main engine is of the Gardiner slide-valve type. The cylinder is 14 inches in diameter, with 36-inch stroke. The speed is 52 strokes per minute when the presses are running, and 54 strokes with the rolls alone. The working horse-power ranges from 45 to 75, according to the number of machines driven. The fly-wheel is 12 feet in diameter, and is in eight sections. The rim is 8 inches deep and 3¾ inches wide; its total weight is 5,206 pounds. The main shaft is 8 inches diameter and 8 feet long; the driving pulley 8 feet diameter and 16 inches face. The main driving belt is known as a "75 horse-power". There are fourteen principal counter-shafts.

The small vertical engine in the assay department has a 4- by 8-inch cylinder, and is rated at 4 horse-power. It drives two pairs of assay rolls and the shaking machine used in the humid test, and runs from three to seven hours per day.

TEMPERING DIES AND COLLARS.—The dies and collars of the coining presses require a high temper, which is attained in this mint by careful heating in a special furnace and instantaneous cooling in an apparatus of peculiar construction. The furnace has a cast-iron shell lined with fire-brick, is 24 by 20 inches, and has a grate area 15 inches square. The fuel is nut-pine charcoal. Four dies or collars are heated simultaneously, the length of exposure being one hour. The quenching vat is made of $\frac{3}{16}$-inch wrought iron, is 26½ inches long, 18 inches wide, and 18 inches deep, and has a close-fitting hinged iron cover. The dies or collars are not immersed directly in water, but are placed in a brass holder, through which, after the article to be tempered has been clamped in place, a powerful stream of cold water is passed. These holders are of two sizes, one for quenching dies, and a larger size for collars. They are made in two parts, with a screw-clamp for securing the die or collar, and are provided with a screw-socket, which fits upon the threaded head of a water-pipe. The mode of application is as follows: The heated die or collar having been clamped in the machine, the latter is screwed upon the pipe and the lid of the vat is closed, these operations being performed in a moment. The stream is then turned on, and plays upon the face of the die or collar, rapidly and uniformly chilling the steel by the constant impact of fresh portions of the water. The pipe is 2½ inches in diameter, and the head is 100 pounds per square inch. The water is allowed to run three minutes, at the expiration of which time the holder is unscrewed and the tempered die or collar is removed and dried.

DRESSING THE ROLLS.—The grinding room is in the front part of the basement. Here the rolls are ground true when their faces have become irregularly worn. This is done by means of a grinding lathe, which has a solid emery wheel 22 inches in diameter and 1¼ inches face and runs at a speed of eight hundred revolutions per minute. The machine requires 8 horse-power. A very light pressure is used. The dressing was formerly done by a grindstone, which gave equally good results, but worked very slowly. The emery wheel accomplishes in one and a half hours' work what requires twenty-four hours if done by a common grindstone.

CHILI MILLS.—The mint contains two Chili mills. Of these the smaller is used by the deposit melter in grinding iron slags, broken crucibles, etc. The larger, in the sweeps room, is used to grind all the miscellaneous savings containing gold and silver, including furnace clinkers, the worn-out melting-pots, and similar matter.

The deposit melter's mill is in an alcove of the basement near the center of the main building. The two cast-iron grinding rollers are 18 inches in diameter and 6½ inches face. The pan is also of cast iron, and is 28½ inches in diameter, with a rim 4 inches high. The rim is 1 inch thick at the bottom and half an inch thick at the top. The die is 1¼ inches thick. The pan makes twenty-three or twenty-four revolutions per minute, and requires about 3 horse-power.

The larger mill is of the same pattern. Its rollers are 28 inches in diameter and 12 inches face. The pan is 4 feet 5 inches in diameter, and has a 6-inch rim, which is seven-eighths of an inch thick at the top and 1 inch thick at the bottom. The die is 2 inches thick. The speed is twenty revolutions per minute, requiring 12 horse-power.

The ground sweepings are sifted through a No. 60 screen and carefully mixed and sampled. The melter and refiner is credited with the assay value of the savings. The latter average $200 per ton, and are sold to the Sacramento or Salt Lake smelters.

SCALES.—Four pairs of Troemner bullion scales are in use—one in the weighing room, where the crude bullion is received, having a capacity of 6,000 ounces; one pair in the cashier's office; one in the melter and refiner's office, and one in the coiner's office—each of which has a capacity of 2,000 ounces.

Besides the two Oertling assay balances already mentioned there are in the mint thirteen small balances, nine in the adjusting rooms, and one each in the rolling-room, cutting-room, melter and refiner's office, and coiner's office.

ELEVATOR.—An elevator runs from the floor of the basement to the second story, and is operated by a worm and screw on a counter-shaft from the line-shaft. The capacity is one ton, the heaviest load being the sulphuric acid tank, which, when full, weighs 1,900 pounds.

DEPOSITS AND PURCHASES OF GOLD AND SILVER BULLION AT THE CARSON MINT DURING THE FISCAL YEAR ENDING JUNE 30, 1880.

Gold	$368,174 51
Silver	622,291 88
Total	990,466 39

This was exclusively bullion of domestic production.

DEPOSITS AND PURCHASES OF GOLD AND SILVER OF DOMESTIC PRODUCTION AT THE CARSON MINT DURING THE FISCAL YEAR ENDING JUNE 30, 1880.

Source.	Gold.	Silver.	Total.
Arizona	$367 91	$12 58	$380 49
California	25,380 85	19,331 05	44,720 90
Idaho	1,374 04	24 72	1,399 36
Nevada	340,837 45	602,920 00	943,757 45
Utah	204 06	3 53	208 19
Total	368,174 51	622,291 88	990,466 39

COINAGE EXECUTED AT THE CARSON MINT DURING THE FISCAL YEAR ENDING JUNE 30, 1880. (a)

Denomination.	Pieces.	Value.
GOLD.		
Double-eagles	1,773	$35,460
Eagles	4,472	44,720
Half-eagles	33,322	166,610
Total gold	39,567	246,790
SILVER.		
Dollars	408,000	408,000
Total coinage	447,567	654,790

a The stock of bullion having become reduced, and the Treasury Department being unable to purchase a supply sufficient to keep the mint running, coinage operations were temporarily suspended from November 1, 1879, to May 1, 1880.

COST OF SUPPLIES AND MISCELLANEOUS EXPENSES AT THE CARSON MINT DURING THE FISCAL YEAR ENDING JUNE 30, 1880.

Acids, sulphuric and nitric	$992 95
Chemicals	137 51
Carpets	203 22
Crucibles, covers, dipping cups, etc	132 45
Castings	385 28
Charcoal	2,010 77
Dry and woolen goods	631 78
Drayage	51 50
Freight and express charges	50 26
Furniture	14 00
Gloves and mittens (buckskin and rubber)	695 00
Glassware	73 85
Hardware, iron and steel	1,942 96
Iron kettles	227 90
Ice	312 09
Lumber	239 08
Oils	164 67
Petty accounts (sundries)	404 27
Plumbing	236 25
Rubber fire hose	212 30
Repairs	1,243 34
Stationery, books, and printing	172 38
Sawdust	7 76
Sundries	310 80
Telegrams	176 07
Traveling expenses	58 25
Water	1,035 00
Washing	79 00
Wood	909 12
Total	13,109 81

EARNINGS OF THE CARSON MINT DURING THE FISCAL YEAR ENDING JUNE 30, 1880.

Charges collected for parting and refining bullion	$9,864 42
Charges collected for alloying gold coins	88 60
Seigniorage on standard silver dollars coined	47,830 29
Proceeds of sale of old material	915 00
Total	58,698 31

EXPENDITURES OF THE CARSON MINT DURING THE FISCAL YEAR ENDING JUNE 30, 1880.

Salaries of officers and clerks	$23,550 00
Wages of workmen	62,294 62
Contingent expenses, not including wastage and loss on sweeps	11,312 73
Parting and refining expenses, not including wastage and loss on sweeps	4,492 08
Expenses of distributing standard silver dollars	108 00
Value of the gold and silver wastage of the operative officers	476 66
Total	102,234 09

PERSONNEL OF THE CARSON MINT, JUNE 30, 1880.

General department, officers, clerks, and assistants	32
Assayer's department, officers, clerks, and assistants	5
Melter and refiner's department, officer, clerk, and assistants (three refiners included)	9
Coiner's department, officer, clerk, and assistant (nine lady adjusters included)	20
Total	66

UNITED STATES MINT AT SAN FRANCISCO, CALIFORNIA.

This mint was visited and reported upon in May, 1881. During the fiscal year ending June 30, 1880, nearly corresponding to the census year, it had coined 10,194,950 pieces, of a value of $36,053,000, running only one shift of eight hours per day. The chief work had been on double-eagles and silver dollars, the value of the former having been $19,216,000, and of the latter $7,910,000. The earnings, including seigniorage on standard dollars, were $1,129,448 74, and the expenses $502,578 67. The total force employed was 257. The San Francisco mint is of large capacity, and is equipped in the very best manner.

MELTER AND REFINER'S DEPARTMENT.

REFINERY.—The refinery includes the corroding-room, the press-room, the reducing-room, and the laboratory, and forms an L on the second floor. The regular force consists of thirteen men, but had been increased to nineteen at the time of the examination, owing to the change in process.

The nitric-acid process.—At the time of examination of this mint the apparatus for the nitric-acid process was being replaced by plant for treatment by the sulphuric-acid process. As the former method is being universally supplanted by the better and more economical process of parting by sulphuric acid, a record of the practice at this mint may be of interest.

Dissolving.—The bullion was dissolved in white stoneware jars imported from Germany, of which forty were in stock, thirty-seven having a capacity of 25 gallons and three holding 18 gallons each. The charge of crude granulated metal averaged 100 pounds per jar, and the quantity of acid added averaged 200 pounds, varying, however, with the quality of the bullion. If the bullion contained much coppery base metal, more acid was required. The strength of the acid was 38° Baumé. The jars were placed on the floors of wooden inclosures, called corroding houses, which were filled with boiling water to a depth of 8 inches. Heat was supplied by live steam from the engine boilers through a coil of iron and copper pipes. There were four of these corroding houses, two having space for twenty-four dissolving jars each, and two holding twelve jars each. The boiling required on an average six hours, though sometimes it was continued for seven hours. At the end of this period the jars were filled with distilled water and allowed to settle over night. The next morning the liquid was siphoned off, and the jars were removed from the bath and emptied of the gold, which was washed and filtered. The gold was then boiled with sulphuric acid of 62° Baumé in iron kettles, washed, pressed in cloth, and dried.

Precipitating.—The acid solution of silver and other nitrates was placed in a precipitating tub and the silver thrown down as chloride by the addition of a strong solution of sodium chloride. The precipitating tubs, of which there were two, were of wood, 10 feet in diameter and 6 feet deep, holding about 5,000 gallons each, and had wooden false bottoms. They were provided with revolving stirrers, and resembled very closely the agitator of a silver mill. After two hours the liquid was drawn off through faucets and filtered. The precipitated chloride of silver was washed in hot undistilled water for eighteen hours or more until freed from all acid, the hot water removing also the small amount of lead present.

Reducing.—The clean chloride was then placed in vats and reduced by granulated zinc. There were six of these reducing vats, each holding 6,000 ounces of chloride. They were rectangular, wooden, and lined with sheet lead. The chloride was first charged into the vats, then the zinc, and water (undistilled) was added. The proportion of zinc to chloride averaged 2,435 ounces of the former to 6,000 ounces of the latter. The charge was stirred with wooden paddles. About six hours were occupied in reduction, or seven hours including the time required for charging, washing, and changing. The zinc salt formed was a waste product, and allowed for in fixing the refining charge. The metallic silver was washed from two and a half to three hours with undistilled hot water in wooden filtering vats lined with lead about 3 feet in diameter. Seven of these vats were in use. The clean silver was formed into cakes by hydraulic pressure and dried. The press was driven by a 10-horse-power engine, and exerted a pressure of 40 tons. It had been in use since 1855. Nine of the pressed cakes gave 3,600 ounces in bars. The drying furnace had a capacity for one hundred and twenty silver cakes. The fuel was redwood, and the heat was maintained at a cherry red. The operation of drying could be finished in six hours, but it was the practice to do the drying over night. The subsequent manipulations were the same as now performed. The dried cakes were melted into mint-fine bars and turned into the melter and refiner's office, the customary sampling and assaying being done by assay bars.

The sulphuric-acid process.—The first kettle charge by this process was made April 19, 1881. The method followed is in general the same as that already detailed in the description of the Carson mint, with, however, the following exceptions: The fire under the parting kettles is started with charcoal and coke and then fed with anthracite. The bullion is charged in the form of granulations, not in shoe-bars. This practice was adopted to avoid dispute with the patentee of a process for parting bars without granulation. The usual charge weighs 4,500 ounces, but if the bullion is of good quality the kettle will safely hold 6,000 ounces. The proportion of acid used is from 3 to 4 pounds per pound of bullion, according to the quality of the latter. If the bullion is very coppery, it requires correspondingly more acid, but in such cases a weaker acid than 62° is used. The first boiling occupies from five to six hours, and the charge is cooled and settled in two hours or is left over night in the kettle, according to the quality of the metal. In discharging the kettles the solution is siphoned off first, the gold being pushed to one side, to allow room for the siphon pipe. This plan has the advantage over that of first ladling out a part of the gold, as it does not subject the operator to the same exposure to the acid fumes.

There are four 20-inch furnaces and four cast-iron kettles for reboiling the parted gold. Each kettle is 33 inches in width at the top and 14¾ inches deep, and holds 15 gallons. Gold parted by nitric acid requires six or seven hours' reboiling, but that parted by sulphuric acid requires only two hours.

The filtering tubs for gold are of wood, each 26 inches in diameter and 23½ inches deep, holding 25 gallons. One small porcelain jar is also used. The straining material is ¼ unbleached muslin in three qualities. Drilling and blankets are also used.

Three and sometimes as many as five charges of acid are generally made; washing is occasionally repeated ten or twelve times. The sweetened gold is at this mint dried in a furnace, just as is the silver cake before melting.

There are two large precipitating vats for the silver-sulphate solution. These have inclined top doors. The proper strength of the solution is reported at 18° Baumé. Precipitation is completed in two days of eight hours' heating each. The copper is used in slabs 24 inches long, 10 inches wide, and 1¼ inches thick, disposed upon the bottom and upright along the sides of the vats. The charge of copper is 3,000 pounds. The precipitated silver is filtered, washed, pressed, and dried as usual. The bluestone formed is crystallized and recrystallized, and is sold in the San Francisco market.

The floors of the press-room and the laboratory are covered with sheet lead, and the other rooms of the refinery are floored with asphalt.

MELTING ROOMS.—The gold and silver are melted in separate rooms. The gold-ingot melting room contains six furnaces 14 inches square. The plumbago pots used are Nos. 45 and 50, and occasionally No. 60. In melting gold, charcoal and occasionally hard coal are used. The silver-ingot melting room has also six furnaces 14 inches square, and the same sizes of crucibles are employed in this room. Charcoal, coke, and hard coal are used as fuel. The furnaces for ingot melting are of the Feix pattern, having a series of air chambers and a water-jacket condenser to diminish the loss by volatilization. The fluxes used are borax, niter, sal ammoniac, bone-ash, and powdered charcoal.

The deposit-melting room contains four furnaces, 14 inches square, for melting bullion on its receipt. There are also in this room six furnaces for melting the large bars to be granulated previous to parting. Four of these are 16 inches and two are 22 inches square. The granulating tubs are of copper, having each a capacity of 100 gallons or more. Charcoal, coke, and hard coal are used as fuel.

The zinc used in reducing the chloride of silver comes in slabs 14 by 7 by 1 inches. A special furnace, 14 inches square, for granulating this zinc is in the basement. There are also two copper-melting furnaces, 14 inches square, in the basement. The copper is melted in Nos. 45 and 50 plumbago pots, and is refined by the Feix process.

The sweeps room has two ovens for drying sweeps, a Chili mill, two amalgamators and concentrators, and a large vat for collecting the sweeps after washing.

In the refinery 7 trucks and 24 carrying tubs are used for transporting bullion, chloride, etc.

A condenser in the attic supplies 2,000 to 3,000 gallons of distilled water per day for use in the assay department and refinery.

COINER'S DEPARTMENT.

The manipulations involved in making coins from the standard ingots are similar to those practiced at the Carson mint with but slight deviations in method, but they are conducted on a much larger scale. The writer is indebted to Mr. Frank X. Cicott, the coiner, for full notes on the system of checks against loss or error followed in this department.

Receiving ingots.—The transfer clerk delivers the ingots to the coiner's department. They are weighed by him in the presence of the coiner's receiving clerk and the melter and refiner, or his representative. The delivery is made in quantities called "melts". Each melt for double-eagles is composed of forty ingots, weighing about 3,000 ounces. When the transfer clerk weighs the melts he takes the weight, number, and denomination of the ingots, as well as the number of ingots composing each melt, and makes the proper entries in his book. The receiving clerk of the coiner's department and the melter and refiner's clerk do the same. Then they carefully compare their respective accounts, and if these agree the melts are turned into the coiner's office, whence they are passed into the rolling-room.

Rolling-room.—This is between the coiner's office and the cutting-room. The total force is 8 men. Here the number and the weight are again taken and entered in the roller's book. Each melt is provided with a copper tag bearing its number, and this tag remains with it during the whole manipulation.

The rolling-room contains four sets of rollers, two break-down and two finishing, having a pressure varying from 20 to 80 tons. The rolling machines are similar to those of the Carson mint, but have not the flat guides for preventing flexure of the strips. The rolls are of cast iron (not steel, as at the Carson mint). The lubricant is castor-oil.

The ingots are now drawn into strips of about 3 feet 6 inches in length by means of this flattening or drawing process, and naturally become brittle and in some cases are split or broken on the ends. To remedy the brittleness the strips are now prepared for the annealer. First, however, the fractured ends are removed by a powerful cutting machine. The thickness of the rolled strips is tested by gauge instead of by weighing a trial planchette.

Annealing room.—This is on the first floor, between the cutting- and the whitening-rooms. The total force is four men. The gold strips are placed in copper canisters, the silver being annealed in open pans. The canisters are of two sizes, those for "short gold" being 3 feet 10 inches long, $4\frac{3}{8}$ inches diameter, outside measurement, and $\frac{3}{16}$ of an inch thick, and those for "long gold" 5 feet 7 inches long, $4\frac{1}{2}$ inches diameter, and $\frac{3}{16}$ of an inch thick. Each is capable of containing twenty strips. The canisters, after being capped and sealed with fire-clay, are placed in a reverberatory furnace, four at a time, where they remain for about one hour. There are four annealing furnaces. The fuel is oak. An hour is usually required with a moderate fire; much, however, depends upon the operator, he being guided solely by his judgment, as no established rule exists. The main point is to see that the heat is equally distributed, and to insure this the canisters are turned half over at intervals of fifteen minutes. Great care must be taken to avoid overheating. When sufficiently heated the canisters are removed from the furnace, by means of iron tongs, into vats containing cold water, and in three or four minutes the caps or seals are removed so as to allow the water to enter. When sufficiently cooled, the strips are dried with cotton cloths and then removed to the rolling-room, to be passed through the finishing rolls and reduced to the required thickness; *i. e.*, the thickness of the coin for which they are intended, which could not be done prior to the annealing by reason of their brittleness. This operation completed, the strips are again returned to the annealing-room for final annealing, which is a necessary preparation for the cutting machine.

Cutting-room.—The cutting-room is on the first floor at the west side of the building, between the rolling- and the annealing-rooms. The force employed in this room is nine men, and two others are engaged in the cleaning room. From the annealing-room the strips are taken to the pointing machine, which shapes the end of each strip so as to admit it with facility in the orifice of the draw-bench, where the strips are reduced to the exact thickness necessary. Before being subjected to the operation of the draw-bench, however, the gold strips are heated to a temperature of 100° F. in a steam chest, and then they are separately covered with melted wax. They are now taken to the draw-bench; one strip is drawn through and passed to the cutter, who cuts off one planchette from the first end and one from the middle of the strip. These planchettes are passed to the foreman of the cutting-room, who weighs them. If he finds them correct, the strip is cut into planchettes. This same operation is performed with each strip. If one is found too heavy, it is again placed in the draw-bench and reduced; if too light, it is placed upon the "light bench", when it is cut by a concave punch, thus correcting the deficiency. There are three draw-benches and four cutting-presses in this room. When all the strips are cut the planchettes and clippings are sent to the cleaning-room.

Cleaning-room.—Here they are boiled in a solution of potash, for the purpose of removing the wax and rendering them perfectly clean. After this they are rinsed in boiling water and dried in a pan heated by steam. When perfectly clean and dry the planchettes are adjusted. The clippings and chips are returned to the transfer clerk in the same manner that the ingots were received.

Adjusting-room.—Gold planchettes are treated as follows: Each planchette is weighed separately, and if too heavy it is reduced by filing the rim by hand; if too light, it is passed to the "light weigher", who weighs it, and in

case it is found to be below the legal limit condemns it. The "standard weighers" weigh every standard gold planchette several times to insure correctness. The adjusting force includes fifty-nine women adjusters and weighers and one forewoman. After all the planchettes have been adjusted, the assistant adjuster takes the different pans of standard planchettes and makes them up in what are called "drafts" of 1,000 pieces each. These drafts are again weighed in the coiner's weigh-room. In the case of double-eagles the draft weighs 1,075.10 ounces, being 0.10 ounce in excess of the legal weight, the surplus being added for loss in whitening and pressing. The legal tolerance allowed on a double-eagle, light or heavy, is 0.5 grain. The working limit used is 0.1 grain on the "standards" and 0.3 grain on the "lights". The "standards" and "lights" are kept in separate boxes containing cards setting forth the exact weight and date of adjustment. The "condemns" are alse kept separate, and are so marked.

Silver planchettes are not adjusted by hand, but those for the large coins are, if necessary, filed by lathes in the coiner's weigh-room. There are two of these filing machines in this mint, and one has been furnished to the New Orleans mint. They reduce twenty pieces at a time very conveniently and rapidly. The strips for dimes and quarters can be adjusted without difficulty at the draw-bench, but those for half-dollars require much care to keep them within the prescribed limits.

Whitening-room.—The gold blanks are placed in iron flasks, which are sealed with fire-clay and placed in the heating furnaces. Silver blanks are charged into the furnaces in copper pans. When thoroughly and uniformly heated the blanks are thrown into a hot bath of water acidulated with sulphuric acid, the same kind of pickle being used for both gold and silver. After remaining in the bath four or five minutes, during which time they are stirred with copper rakes, the blanks are removed, rinsed with boiling water, and dried in steam-heated open pans with basswood sawdust, being stirred with wooden paddles until dry. The wastage of gold blanks is reported to be the same as at Carson; that of silver blanks is stated at from 0.20 to 0.30 grains per draft treated. The force employed in the whitening-room is a foreman and four assistants.

Press-room.—After the whitening process, and having been reweighed, the blanks are delivered to the foreman of the press-room and coined. The press-room is at the southwest corner of the first floor. It contains six coining presses, four of which are used in making double-eagles and standard dollars. These larger presses turn out eighty pieces per minute, and exert a pressure which is stated at 175 tons or more. One of these, known as Black Bess, was taken to San Francisco before the construction of the first mint there, and was used by private coiners. It has been in operation very steadily, and is said to have coined over $400,000,000 gold. Another press is of the Ajax model, previously described. The smaller presses coin subsidiary silver or small gold pieces. They strike from one hundred and twenty to one hundred and forty pieces per minute, exerting a pressure of from 30 to 60 tons, according to the denomination made, and have brass levers. The lubricant for the presses is refined sperm oil.

From the press-room the coin is returned to the weighing-room. After coining the dies are taken from the presses and stored in a vault.

The "making-up" of coins.—The legal weight of $20,000 in double-eagles is 1,075 ounces. The number of pieces requisite to represent that sum are placed in a steel pan upon the scales. In case the weight is too great, some of the pieces are withdrawn and are replaced by "lights" until the legal weight is obtained. The coin is then put into boxes, 1,000 pieces in each, and the superintendent is notified that an amount of coin is ready for delivery. The cashier of the mint, representing the superintendent, selects the number of coins provided by law from each box and weighs them with his standard weight. If the weight is within the legal limit, the delivery is accepted, and a receipt is given. The assayer's representative also takes one piece (which he replaces by another), to be disposed of as the law directs. The condemned blanks and coins are delivered to the superintendent in the same manner as the clippings. The dust and filings are retained until the annual settlement.

System of accounts.—As an instance of the care taken in the mints to prevent loss or error and to keep a complete and intelligible record of all operations an outline of the system of bookkeeping practiced in the coiner's department of the mint is quoted below from a report made by Mr. Cicott. In the other departments of the mint, and indeed throughout all the branches of the mint bureau, a similar system is observed. It would be well if the same care were taken in all mining and metallurgical establishments, for comparisons and improvements in practice can best be made by means of accurate records of daily results. A few of the mining companies pursue the plan of recording their operations in some detail, and it is noteworthy that in precisely such cases the closest and most successful working is to be found. This is to be expected, if for no other reason than that a detailed system of accounts involves constant and minute inspection.

The books containing the accounts with the different branches of the coiner's department in the San Francisco mint are the journal, ledger, working book, cash book, abstract of coinage, and delivery book.

The journal shows a complete record of all receipts of ingots and delivery of coin, clippings, and "condemns" by days, and fully specified. The ledger contains the same in daily totals.

The working book contains in different columns: (1) The number of the melt; (2) the weight of the melt and the number of ingots composing it; (3) the roller's account, setting forth the weight of strips, chips, and dust returned, and also stating the amount of loss; (4) the cutter's account, setting forth the weight of planchettes, clippings, and dust returned, and also stating the amount of loss; (5) the adjusting account, setting forth the weight of adjusted blanks condemned, blanks and filings returned, and also stating the loss; (6) the milling and cleaning account,

showing the weight of blanks (annealed) returned, and stating the loss; (7) the press-room account, setting forth the weight of coin turned out, and also stating the weight of blanks injured by accident and condemned; (8) the recapitulation column, showing the amount of coin, "condemns," condemned coin, clippings, chips, dust and filings, and the amount of loss on the total workings.

The cash book contains the amount of coin daily made, in ounces, on the debit side. On the credit side it shows the amount delivered, in ounces and dollars; also the number of the delivery.

The abstract of coinage shows the weight of ingots received monthly, and the amount in dollars of the several denominations (in separate columns) of coin delivered.

The delivery book shows the number of the delivery, the number of drafts, the amount in dollars, the actual weight, the legal weight, the variation, and the denomination of all coin deliveries made to the superintendent.

Statements of the entire workings of the coiner's department are rendered to the superintendent weekly, monthly, quarterly, and annually. The pay-roll is made out monthly. The roll-book also sets forth the name, date of appointment, and all particulars regarding the resignation or removal of each employé.

The supplies are procured upon a printed requisition to the superintendent, and copies of all such requisitions are kept in the coiner's office. When bills are presented, they are certified to by the officer in charge and are sent to the superintendent for approval.

ASSAYER'S DEPARTMENT.

The assay department occupies seven rooms at the south end of the second floor, consisting of the office, gold-weighing room, laboratory, fire-assay room, humid assay room, humid assay weighing room, and the furnace and dissolving room. The assay force is twenty-one, including the assayer, assistant assayer, second assistant, foreman, seven weighers, two cupellers, three dissolvers, two chippers, engineer, fireman, and porter. Ten Oertling and two Becker balances are in use.

Sampling.—The chips from deposit assay gold bars are taken in the assay department. They weigh 0.27 ounce each. The silver granulations weigh several ounces, of which 0.45 ounce is taken for each of the pair of top and bottom samples. With large melts of gold the samples are diagonal corner chips from alternate bars cast. The chips of mint-fine gold weigh 0.30 ounce each, and those of mint-fine silver 0.25 ounce.

Assaying.—Duplicate assays are made for gold and for base metal. All assays of silver in silver bullion are made by the humid method of Gay-Lussac. The gold in silver bullion is determined by the synthetic method, sufficient gold being added to keep the cornet from breaking. All silver assays are reported in tenths of thousands fine.

Apparatus.—There are two muffle furnaces in the furnace room. They have three muffle doors, of which the upper is used for annealing cupels and the two lower for cupelling. There is one assay furnace in the same room. It is 13 inches square, and holds six No. 12 crucibles. The laboratory contains two sand-baths. The boiling is done over a series of large gas-burners. Four pairs of power-rolls are in use—one for lead, one for gold, one for silver, and one for rolling cornets. There are two shaking machines for the humid assay, similar to that at the Carson mint. They are driven by rod from a small upright engine.

MISCELLANEOUS.

The building.—The mint is on the west side of Fourth street, occupying a lot which has a block front between Mission and Jessie streets. It is of Portland freestone, with granite and concrete foundations. It has two stories, a basement, and an attic. The girders are of iron, and the roof is of galvanized and corrugated iron, except in a small part, which is of wood sheathed with copper. The extreme dimensions are 296 by 163 feet. There are two stacks, about 130 feet high, one used for the boilers and whitening rooms and the other for the refinery, though the two can be used in connection. The building was designed by A. B. Mullett, architect, and upon its completion, in 1874, the old mint building was abandoned.

Boilers.—There are four boilers, arranged in pairs, but so connected that one or more may be used independently. They are 48 inches in diameter, 15 feet long, and have thirty-eight 3¼-inch flues each. They consume about 3 tons of coal per day, when all are in use. The boilers are on the ground floor.

Engines.—There are five engines in this mint. The largest, known as No. 1, drives the rolls only. It is a parallel motion beam engine, with vertical cylinder 20 by 45 inches, has Myers' cut-off, and is rated at between 150 and 200 horse-power. The speed is forty-five strokes per minute, and is regulated by a Gardiner governor placed 5 feet from the steam-chest. It was made in San Francisco, and is a fine example of workmanship.

No. 2 drives the coining presses and draw-benches, and is in constant use. It is a direct acting 12- by 24-inch 50 horse-power engine.

No. 3 runs the elevator and the machinery of the sweeps room (Chili mill, amalgamators, etc.). It has a vertical 8- by 12-inch cylinder, mounted over the crank-pin, and is rated at 15 horse-power.

No. 4 furnishes power for the hydraulic press. It has a 7- by 10-inch cylinder, and develops 10 horse-power.

No. 5 is a small vertical 8 horse-power engine in the assay department. Its cylinder, 6 by 8 inches, is over the crank-pin.

The following statement shows the working results of an average month:

SYNOPSIS OF ENGINEER'S LOG, SAN FRANCISCO MINT, FOR THE MONTH ENDING JANUARY 31, 1881.

Coal consumed, tons of 2,240 pounds	75
Percentage of waste in ashes and clinker	19.5
Feet of wood consumed	11
Number of hours fires were lighted	237
Average pressure of steam on boilers ..... pounds	65
Average temperature of engine-rooms ..... degrees Fahrenheit	87.5
Average temperature of fire-rooms ..... do	75.5
Average temperature of feed-water ..... do	140
Number of hours run, engine No. 1	109
Number of hours run, engine No. 2	203
Number of hours run, engine No. 3	65
Number of hours run, engine No. 4	86
Number of hours run, engine No. 5	192
Number of hours steam used in refinery	85
Number of hours steam used in waxing machines	109
Number of hours steam used in drying-rooms	141
Number of hours distilling water	87
Number of hours steam-pump running	175
Average revolutions per minute of engine No. 1	41.5
Average revolutions per minute of engine No. 2	80
Average revolutions per minute of engine No. 3	169
Average revolutions per minute of engine No. 4	175
Average revolutions per minute of engine No. 5	180
Gallons of oil consumed	10
Pounds of cotton waste consumed	45
Pounds of lubricating cream consumed	10

Pumps.—Two steam pumps are used in connection with the artesian wells. There are two of these wells on the ground, one 200 feet and one 250 feet deep. The pumps raise from 40,000 to 60,000 gallons, the amount required by the mint, in eight hours. They take steam at 65 pounds pressure. The water is decanted before being fed to the boilers, but no chemicals are used.

DEPOSITS AND PURCHASES OF GOLD AND SILVER BULLION AT THE SAN FRANCISCO MINT DURING THE FISCAL YEAR ENDING JUNE 30, 1880.

Description.	Gold.	Silver.	Total.
Re-deposits, unparted bars	$116,111 22		$116,111 22
Bullion of domestic production	27,546,640 57	$9,967,566 59	37,514,207 16
United States coin	55 00	6 00	61 00
Foreign bullion	264,785 80	861,488 68	1,126,274 54
Foreign coin	599,730 45	13,222 21	612,961 66
Jewelers' bars, old plate, etc	18,212 36	107 10	18,319 46
Gold and silver received and operated upon	28,545,544 46	10,842,390 58	39,387,935 04
Less re-deposits	116,111 22		116,111 22
Total deposits and purchases	28,429,433 24	10,842,390 58	39,271,823 82

DEPOSITS AND PURCHASES OF GOLD AND SILVER OF DOMESTIC PRODUCTION AT THE SAN FRANCISCO MINT DURING THE FISCAL YEAR ENDING JUNE 30, 1880.

Source.	Gold.	Silver.	Total.
Alaska	$5,950 90		$5,950 90
Arizona	152,967 26	$831,016 67	983,983 93
California	7,033,656 05	283,734 46	7,317,390 51
Colorado	338 72		338 72
Dakota	64,350 06		64,350 06
Idaho	365,570 55	88,724 16	454,294 71
Montana	16,441 84	259,086 30	275,528 14
Nevada	38,119 81	4,123,732 53	4,161,852 34
Oregon	552,280 41	1,174 26	553,454 67
Utah	13,295 30	11,827 38	25,122 68
Washington	34,529 24		34,529 24
Wyoming	328 84		328 84
Refined bullion	18,161,943 52	2,970,757 92	21,132,701 44
Parted from silver	1,106,868 07		1,106,868 07
Parted from gold		78,278 43	78,278 43
Other sources		1,319,234 48	1,319,234 48
Total	27,546,640 57	9,967,566 59	37,514,207 16

COINAGE EXECUTED AT THE SAN FRANCISCO MINT DURING THE FISCAL YEAR ENDING JUNE 30, 1880.

Denomination.	Pieces.	Value.
GOLD.		
Double-eagles	960,800	$19,216,000
Eagles	461,250	4,612,500
Half-eagles	862,900	4,314,500
Total gold	2,284,950	28,143,000
SILVER.		
Dollars	7,910,000	7,910,000
Total coinage	10,194,950	36,053,000

EARNINGS OF THE SAN FRANCISCO MINT DURING THE FISCAL YEAR ENDING JUNE 30, 1880.

Charges collected for parting and refining bullion	$158,477 34
Charges collected for alloying gold coins	2,743 24
Seigniorage on standard silver dollars coined	965,279 71
Amount received for assays of ores	99 00
Grains, fluxes, and sweepings from deposit-melting room	1,393 70
Proceeds of sale of old material	1,455 75
Total	1,129,448 74

EXPENDITURES OF THE SAN FRANCISCO MINT DURING THE FISCAL YEAR ENDING JUNE 30, 1880.

Salaries of officers and clerks	$24,900 00
Wages of workmen	252,235 75
Contingent expenses, not including wastage and loss on sweeps	41,313 81
Parting and refining expenses, not including wastage and loss on sweeps	137,671 98
Expenses of distributing standard silver dollars	210 18
Value of the gold and silver wastage of the operative officers	29,273 07
Loss on sale of sweeps	16,973 88
Total	502,578 67

WASTAGE AND LOSS ON SALE OF SWEEPS AT THE SAN FRANCISCO MINT DURING THE FISCAL YEAR ENDING JUNE 30, 1880.

Melter and refiner's gold wastage	$5,253 82
Coiner's gold wastage	2,188 32
Melter and refiner's silver wastage (*a*)	21,706 69
Coiner's silver wastage	119 24
Loss on sale of sweeps	16,973 88
Total	46,246 95

PERSONNEL OF THE SAN FRANCISCO MINT, JUNE 30, 1880.

Superintendent	1
Melter and refiner	1
Assayer	1
Coiner	1
Chief clerk	1
Cashier	1
General department	63
Assay department	21
Melting and refining department	53
Coiner's and adjuster's departments	114
Total	257

a Largely owing to the fact that no deduction from the weight of low grade and refractory bullion, as authorized, had been made.